EADING

The Farm

QUARTERLY

MMER 1950 • PRICE 50 CENTS

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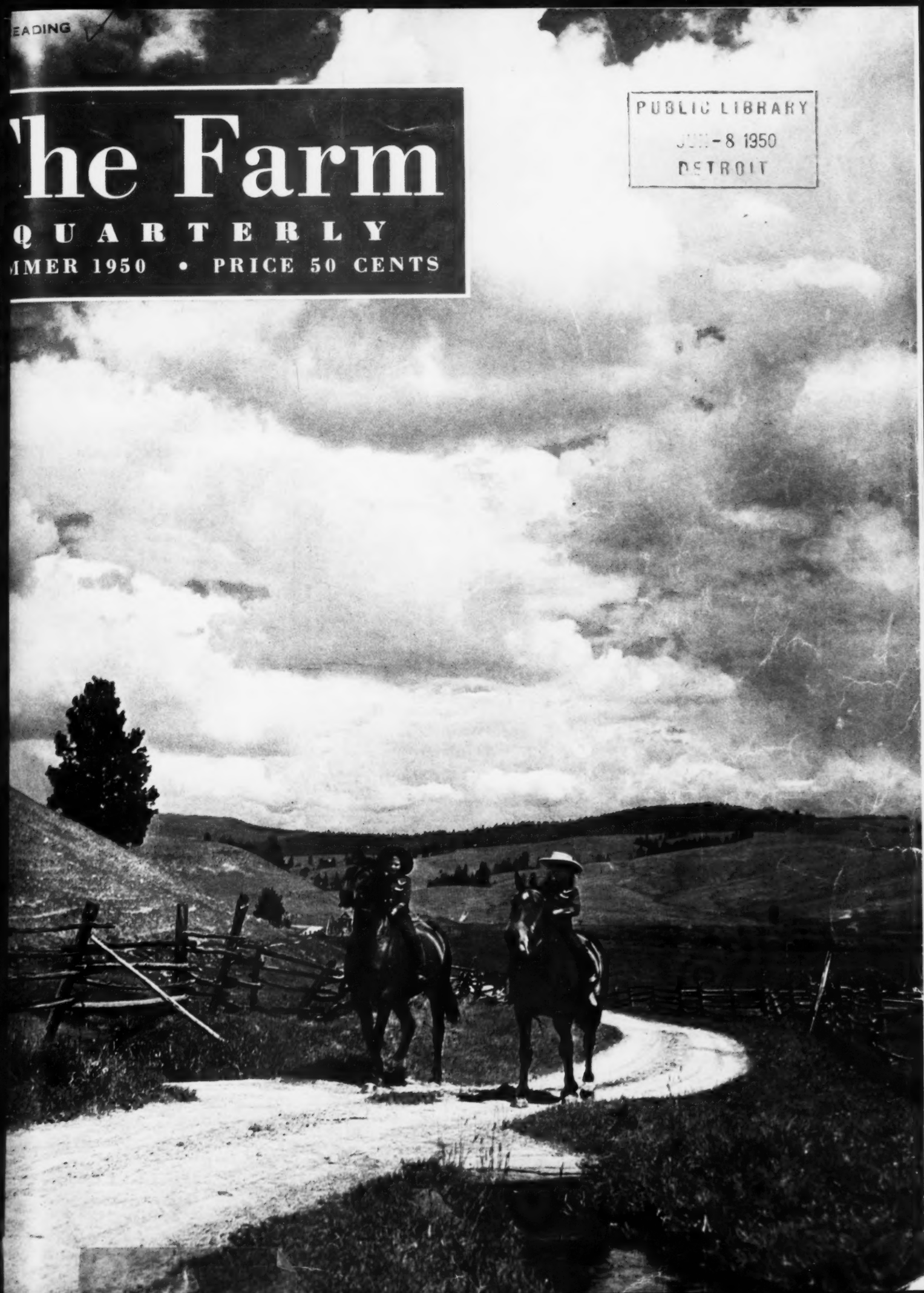

Many Millions of Milkings on many kinds of cows in many countries is the best guarantee you can get that SURGE will do a fast, safe job of milking *your* cows.

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Your Surge Service Dealer Will Show You

BABSON BROS. CO.

Dept. 279-A, 2843 W. 19th St.,
Chicago 23, Ill.

SURGE

SYRACUSE • HOUSTON • EL MONTE (Calif.) • KANSAS CITY • TORONTO • ATLANTA • SEATTLE • MINNEAPOLIS

Harvesting with a Farmall M tractor and a McCormick No. 62 combine

When you get ALL the facts you'll choose a FARMALL*

Farmalls are the largest-selling tractors in America today. Folks buy more Farmalls than any other make. You, too, will get a Farmall if you'll check ALL the facts . . . facts like these:

Right size. There are *five* Farmall tractors. One of them, or a combination of two or more, will give you ample, *economical* power for every job on your farm.

Right implements. For each of the five Farmalls there's a *complete line* of matched, quick-change McCormick implements . . . every machine you need for every crop you grow.

Versatility. Each Farmall gives you high crop clearance, pin-point turning, easy-to-adjust wheel tread, and hydraulic implement control.

Comfort. On the easy-riding Farmall seat you're up above the dust and engine heat. You reach all the controls without stretching. With forward-mounted implements you face *ahead* to watch both your work and your steering.

Fuel economy. Farmalls are unexcelled in the work they do per gallon of fuel. That's because they are right in weight, weight distribution, and wheel size for good traction . . . and right in engine design and in provisions for mounting and hitching implements.

Quick service. Parts and service can always be had from a nearby IH dealer.

Time-proved dependability. More than 1,300,000 Farmalls—far more than any other make—have proved their lasting dependability.

Check these and other Farmall facts before you buy! Ask your IH dealer for a free demonstration on your farm.

You'll find all the facts in these FREE BOOKLETS

Send the coupon today for any or all of these free booklets. They'll let you go "window shopping" at home for your ideal tractor.

International Harvester Company
P. O. Box 7333, Dept. E, Chicago 80, Illinois

Please send me free booklets on:

- ☐ Farmall Cub—1-plow tractor
- ☐ Farmall Super-A—1-plow tractor
- ☐ Farmall C—1 to 2-plow tractor
- ☐ Farmall H, M, and MD (Diesel) —2-plow and 3-plow tractors
- ☐ I'd like a Farmall demonstration on my own farm.

I farm _____ crop acres.

My main crop is _____

Name _____

Post Office _____ State _____

My IH dealer is _____

mid-century 1950

INTERNATIONAL HARVESTER

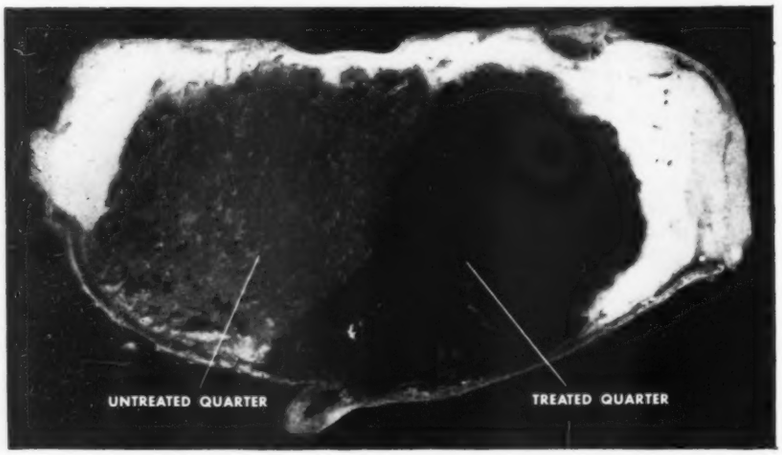
International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Crawler Tractors and Power Units . . . Refrigerators and Freezers

*Registered Trade Mark

Today's most widely-accepted treatment for mastitis*!

SQUIBB "INSTANT-USE" PENICILLIN!

EASY TO USE! Simply unscrew cap, insert tip of Squibb Penicillin Ointment tube into teat, squeeze out ointment, massage upward into quarter. That's all!



EFFECTIVE! A simple experiment, results of which are shown in this unretouched photograph of a detached udder frozen for cross-sectioning, demonstrates how thoroughly Squibb Ointment disperses penicillin throughout a treated quarter of a cow's udder.

• **Widely accepted** because it is a completely proved product. More than *one million* cases of mastitis* have been successfully treated with Squibb "Instant-Use" Penicillin. Penicillin is the "product of choice" of veterinarians and farmers.

• **Widely accepted** because only one tube is required for many cases. Once injected, Squibb Penicillin Ointment continues its effective action even after several milkings.

• **Widely accepted** because penicillin ointment is the most economical of all mastitis* treatments. Squibb "Instant-Use" Penicillin Ointment costs you up to 66% less than other types of treatment.

• **Widely accepted** because it's a clear ointment, and won't discolor milk.

Dairymen who keep Squibb "Instant-Use" Penicillin always on hand in the barn, treat mastitis at the first sign—stop its spread—save themselves many dollars! Ask your druggist for Squibb "Instant-Use" Penicillin!

For SCOURS in calves and other young animals—PENOVOXIL CAPSULES. A specially prepared, exclusive Squibb formula—only product of its kind on the market. Effective—easy to use—no drenches—no injections. Write to E. R. Squibb & Sons, Veterinary and Animal Feeding Products Division, Dept. FQ-20, 745 Fifth Avenue, New York. Literature on Penovoxil Capsules, and other Squibb specialties available on request.

*Due to *Streptococcus agalactiae*, the cause of the largest percentage of all mastitis cases.

SQUIBB — A NAME YOU CAN TRUST

NOW YOU CAN DECIDE which TRACTOR TIRE YOU NEED ON YOUR FARM...

THE... Firestone

★ OPEN CENTER OR ★ TRACTION CENTER

WILL your next tractor tires have the *New* and *Advanced Firestone Open Center tread* — or the famous *Firestone Traction Center tread?* You make the decision because you know which type of tread will work best in your soil. Whichever tread you prefer, Firestone — and only Firestone — can give you your choice.

The *New* and *Advanced Curved Bar Open Center Firestone* tire is the only Open Center tire with power-arc traction bars. They're curved and tapered to give maximum pulling power. Flared bar openings, with no mud pockets at the shoulder, insure quick and positive cleaning. Twin Punch Protectors lengthen body life. These are just a few of the reasons why the *Curved Bar Open Center Firestone* is the leading tractor tire in its field today.

If you need a *traction center* tire, you can always depend on the *patented Traction Center Firestone Champion* to give you top performance. It has been time-tested and time-proved by thousands of farmers the nation over. Many of them will have no other tire.

Again we say, get the tire that will do the best job on your farm — either the *New* and *Advanced Curved Bar Open Center Firestone* or the *famous Traction Center Firestone.* And remember, you don't have to shop around. Your Firestone Dealer or Store has both tires.

Always Buy Tires Built By FIRESTONE, the Originator of the First Practical PNEUMATIC TRACTOR TIRE!

Listen to the Voice of Firestone every Monday evening over NBC

Copyright, 1950, The Firestone Tire & Rubber Co.

Studebaker ¾-ton 8-foot pick-up—½-ton 6½-foot and 1-ton 8-foot also available

Cut your farm expense–get a thrifty Studebaker truck

THIS is the year that a thrifty new Studebaker truck can be a real bank-account help to you and many another farm operator.

It's important now to cut costs—and every inch of a Studebaker truck's rugged structure is designed to save you money on repairs.

Even the front of the husky frame is reinforced with a rigid, twist-resisting K-member.

Extra savings with automatic overdrive! The new Studebaker ½-ton and ¾-ton trucks are now available with automatic overdrive—it costs extra but it saves extra on gas—greatly reduces engine wear, too.

What's more, there's new pulling power as well as new operating economy for you in the stepped-up horsepower and high torque of Studebaker's modernly designed Econ-o-miser and Power-Plus truck engines.

Get your hauling done for less money this year and for years to come. Stop in and give the new Studebaker trucks a thorough looking over at a Studebaker dealer's showroom near by.

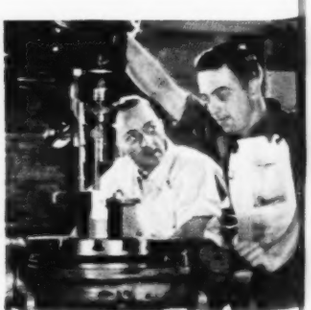
STUDEBAKER TRUCKS

Noted for low-cost operation

A truck just right in size and wheelbase for farm hauling is available in a 2 ton, 1½ ton, 1 ton, ¾ ton or ½ ton Studebaker. All Studebaker trucks have "lift-the-hood" accessibility.

All the family likes this roomy cab! The wide seat has an Adjusto-Air cushion. The doors close securely on tight-gripping rotary latches. The floor is conveniently low—no strenuous climbing. Steps are enclosed.

Studebaker pick-up box is double-walled with heavy-gauge metal—tail gate is hinged at center as well as each end—loads slide on and off with ease. Big visibility rear window for easy backing and parking.



Built by father-and-son teams other trustworthy craftsmen. Stu baker trucks stand up superbly un hard use, seldom need costly rep

The Studebaker Corp'n, South Bend 27, Indiana, U.

COMING IN AUTUMN

Scotch farmers have always been grass farmers. They grow fine animals and do an expert job of producing milk and meat in a land where little grain will grow. They have known for a long time what Americans are just learning—that there are profits in good grass. Farm Quarterly will report on a 500-year-old farm in Northern Scotland where 100 Ayrshires are producing milk for Glasgow and Aberdeen—and all on grass and a few oats and turnips.

That perennial battle, stanchions vs. milking parlor, still rages. The Farm Quarterly, acting as a referee, will review both sides of the question for one of the outstanding articles of Autumn. Other stock stories will include the latest reports on beef bull progeny testing, how to build up a dairy herd of grade cows, and a memorial on the Longhorn of fond memory.

Crop stories will include a survey of what has been done to lengthen the pastures of the Midwest and South, the future of the soybean, and grain sorghum as a silage, grain, and pasture crop.

If the refuse of our cities could be channeled back to the farms from whence it came it would do much to halt the rapid depletion of our soils. That the immediate future will bring a fertilizer made from sewage and garbage is encouraging news to conservationists. An Autumn article will review what is being done in this field.

Few American farms are producing as much as they did when the first owner broke the virgin sod. Yet there are farms which have gone on record as producing more today than in 1850. One of these farms, in the same family for more than a century, is the subject for an Autumn story.

In a short feature the meadow mouse, that voracious free boarder on every farm, will be exposed for the sponger that he is. Other features will include "How to Make Butter," "The Biggest Country Store in the World," "Pasture for Poultry," and the customary picture section, "Autumn on the Farm," in color.

The first farmer was the first man and all historic nobility rests on possession and use of land.—EMERSON.

THE FARM QUARTERLY
22 East 12th St., Cincinnati 10, Ohio

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Contributing Editors: **Myron S. Hazen, G. N. Hoffer, Charles Krutch, C. M. Long, George D. Scarseth, Katharine A. Smith.**

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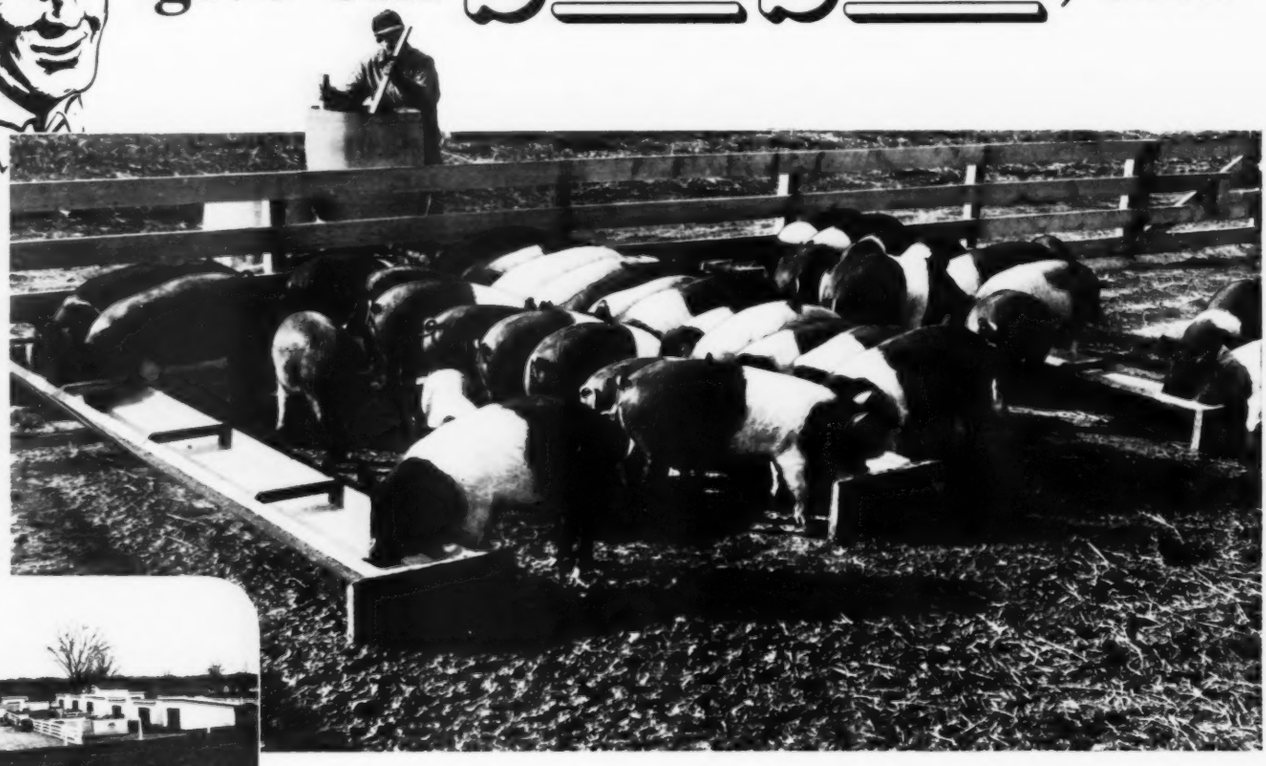
"give 'em Semi-Solid, son"



Gentry Farm, Indiana

Conner Prairie Farm, Indiana

Christiansen Farm, Iowa

Many a father has looked over the fence at his son's pigs around weaning time or just after a spell of bad weather and said, "Better give them a little Semi-Solid, son."

It's the old story of the experienced hog raiser knowing the value of extra nutrition during critical feeding periods.

But the feeding of Semi-Solid SOW Emulsion and Semi-Solid PIG Emulsion is also a good sound investment day after day . . . from the time you breed your sows until you market your pigs.

At last year's high feed prices, for example, feed cost per cwt. of gain was just $9.93 on the Semi-Solid Farm. And those fast-growing, early-to-market pigs were fed Semi-Solid Emulsions every day, all the way.

You need not be a big hog raiser to get the large-litter, fast-growth advantages of feeding Semi-Solid SOW Emulsion and Semi-Solid PIG Emulsion. Buy both feeds in low-cost, 100-pound drums or larger barrels.

Begin today to "give 'em Semi-Solid". . . SOW Emulsion for sows, boars and suckling pigs . . . PIG Emulsion for market hogs.

"The Semi-Solid System" in Action

Scores of Corn Belt Farms now raise hogs by the "Semi-Solid System." Many of these labor-saving, hog-raising units are under construction right now. Look into this streamlined program of hog raising today. The plans, blueprints and hog-raising ideas we have will be of interest to you. They're FREE. Just drop us a postcard.

"The Semi-Solid System" OF RAISING HOGS

FED FROM BREEDING TO WEANING FED FROM WEANING TO MARKET

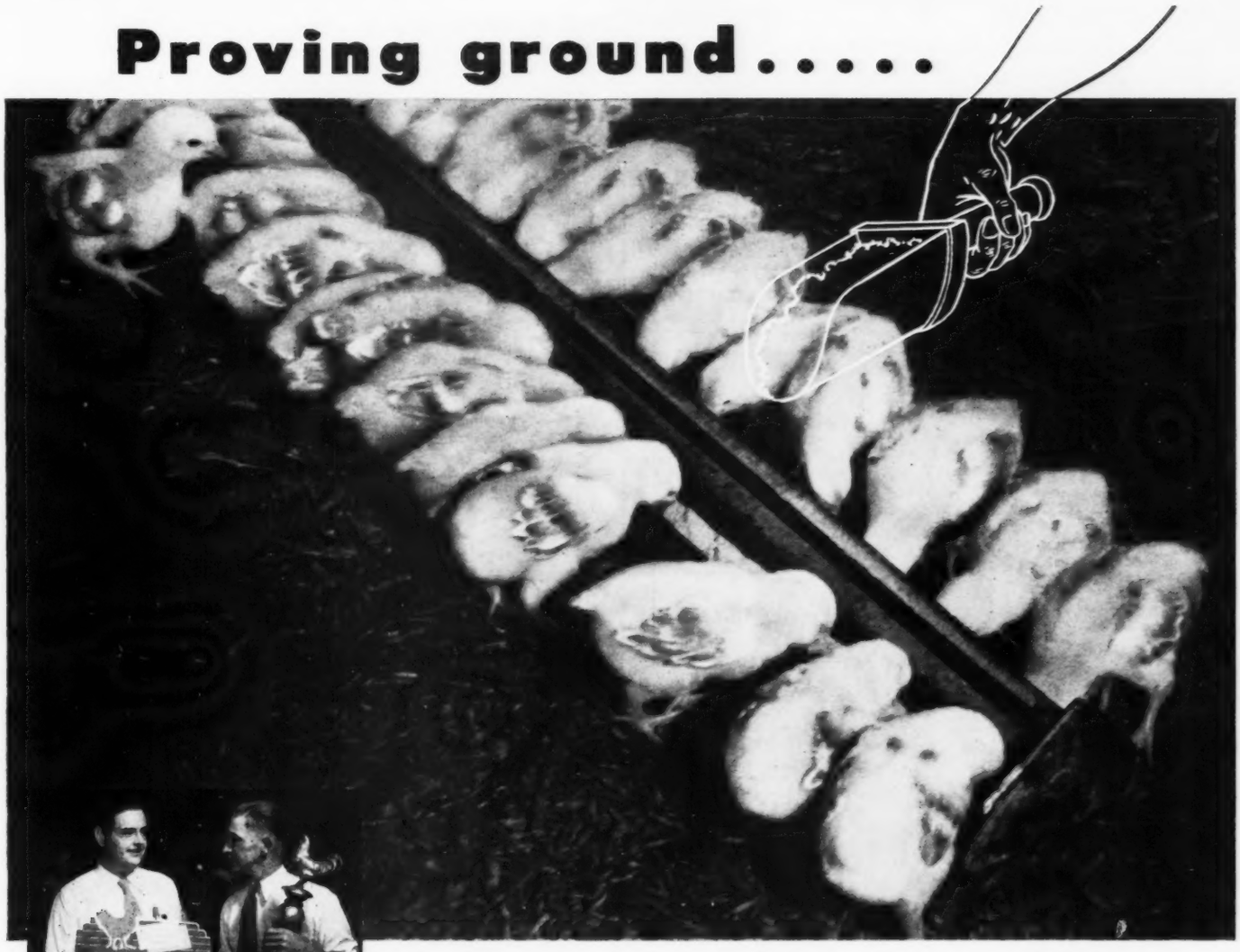
CONSOLIDATED PRODUCTS COMPANY, 119 N. Washington, Danville, Illinois

Gentlemen: Please send me your FREE plans, blueprints and hog-raising ideas as outlined by your Semi-Solid System.

Name_____

R. F. D._____ Town_____ State_____

Proving ground.....



Bob Martin (right), Vice President, Martin's Hatchery, Inc., Ramsey, Ind., and L. A. "Tiny" Wilhelm, State Poultry Association of Indiana, with winning entry in Indiana Chicken-of-Tomorrow contest—Dark Cornish raised on Seagram Solubles supplemented feed.

for Profit Feeding

There's no better place to test the value of chicken rations than in today's modern hatchery. For here, by carefully observing the records of the breeder flocks . . . as well as the development of the chicks themselves . . . important comparisons are brought to light. It has been found, for example, that when Seagram Solubles are included as a regular part of the feeding program the results are: sturdier breeder flocks . . . more and larger eggs . . . bigger chicks and fewer profit-losing culls. Facts like these substantiate the importance of Seagram Solubles in all poultry rations. Whether you're feeding flocks for hatching eggs . . . for market eggs . . . or to develop broilers . . . Seagram Solubles in their rations will pay off in added profits.

Write for Free Booklet "Feed Supplements and Proved Formulas"

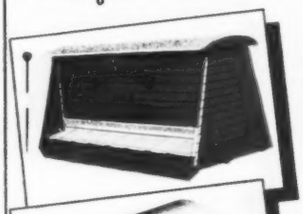
Jos. E. Seagram & Sons, Inc., *Grain Products Division,*
Box 240, Louisville 1, Kentucky.

Seagram

SERVICE TO AGRICULTURE

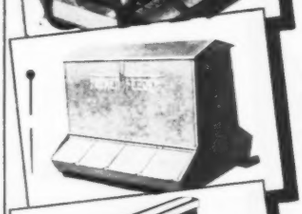
IT'S FARMER FEEDER EQUIPMENT

Dear Neighbor,
These days, all farmers are more than ever interested in reducing costs and increasing profits. Here's the equipment to do that job . . . .

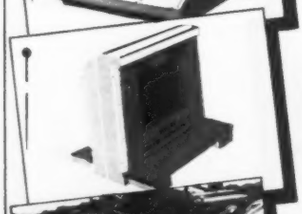


WOOD STEEL CLAD FEEDERS
Sturdy and weatherproof, these units are available in sizes 1 to 10. No clogging or bridging of feed. New type agitator, suspended while in use. Two coats of high gloss orange enamel.

FARMER ROLL-A-VAC FOUNT
Roll 'er up for filling, down for operation. This compact unit accommodates 100 hogs, holds 85 gallons, is made of heavy gauge steel. Also available is a Turkey Roll-A-Vac Fount.

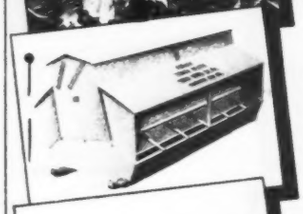


FARMER ALL STEEL FEEDER
Made of heavy galvanized steel, supported by oak runners with two eyes. This feeder does not tilt, is built for rough treatment and comes in No. 4 and No. 6 size.

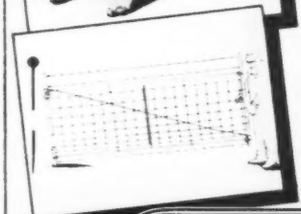


FARMER SALT SELF FEEDER
For hogs, cattle, sheep. Stake to ground or hang on fence, bunkers, etc. Saves $$$$ in supplement consumption. Keeps free running salt before stock at all times. Easy to move.

ALL ELECTRIC Broadcast SEEDER
Here's the seeder that'll sow ANY seed or grain that can be broadcast. Fits on front or rear of your tractor, truck, jeep or car. Sow up to 20 acres per hour. This seeder is battery operated, NOT power-take-off.



FARMER TURKEY FEEDER
Good news for you turkey raisers. Keeps feed dry, takes care of about 300 turkeys, holds 1 ton of feed, features feed gate adjustments, heavy steel constructions. Easy to move, easy to fill.



FARMER ALL STEEL GATES
Adjustable angle brace, all steel gate that won't whip or sag. Strong construction, aluminum dipped, gives extra protection with barbs on top and bottom. Hogs can't root gate open. 10, 12, 14 and 16. ft lengths.

FARMER FEEDER
Company, Incorporated
CAMBRIDGE CITY, INDIANA
PLANTS AT CAMBRIDGE CITY, IND., AND MARION, IOWA

Please send at once your FREE literature on the items ✓ below.
☐ WOOD STEEL CLAD FEEDER ☐ ROLL-A-VAC FOUNTAIN
☐ ALL STEEL FEEDER ☐ SALT SELF FEEDER
☐ ELECTRIC BROADCAST SEEDER ☐ TURKEY FEEDER
☐ ALL STEEL GATES

NAME_____
ADDRESS_____
CITY_____ STATE_____

FROM HORSE THIEVES TO FIRE TRUCKS

Sir:

Your article "Farm Fires" (spring 1950) recalled to my mind the story I recently heard about how a nearby fire department was financed. I believe it was the city of Malvern, Iowa, that had a fund of $750 originally set aside to catch horse thieves. Horses aren't as common around here as they once were, and the money had not been needed to catch thieves for some years. Recently the fire department of Malvern managed to get this money released and used it to help pay for a 350 gallon tank truck. This is one of the few good things that have come from horse stealing

Bernie Goodfader

Elliott, Iowa

DO MULES FAVOR BIRTH CONTROL?

That poor Mama mule on page 33 of the Spring issue drove me into poetry-writing.

The picture on page 33

MISS MULE'S MISTAKE.

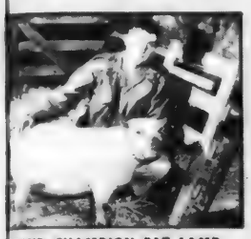
From near a Louisana city
Comes a story full of pity,
All about a Miss Liza Mule
Who had broken every rule
We were taught —
She got caught.

Mules are sterile she was told
And no offspring will they foal,
So she mingled with the masses,
Vamping young and old Jackasses,
Did Miss Liza —
Now she's wiser.

Right beside her in a stall
Stands a young'un near the wall,
A freak of nature so 'tis stated,
For mules have always advocated
Birth control,
So we're told.

Atlanta, Ga. Sam Mims

WAYNE Winners!

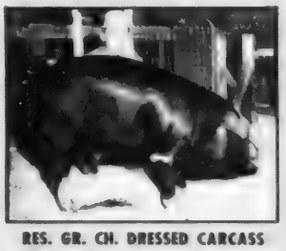


GRAND CHAMPION FAT LAMB
1949 Wisconsin State Fair
Wayne Disch, Evansville, Wisc.

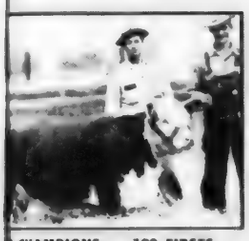
7 CO. FAIR CHAMPIONSHIPS
Lyle F. Truckenbrod
Mendota, Illinois

JR. SHOW CHAMPION BULL
1949 Wisconsin State Fair
William Jones, Jr., Oregon, Wisc.

GRAND CHAMPION COW
1949 Illinois State Fair
Lakewood Farm, Mundelein, Illinois



RES. GR. CH. DRESSED CARCASS
1949 International Livestock Exp.
J. L. Stuckey, Wilmington, Ohio



CHAMPIONS . . . 123 FIRSTS
1948 and 1949 Co. and State Fairs
Gary Adams, Allendale, Illinois

GRAND CHAMPION BOAR
1949 Wisconsin State Fair
Howard and Rex Johnson, Beloit, Wisc.

JR. & RES. GR. CHAMPION BULL
ALL-AMERICAN SR. YR. BULL
1949 International Dairy Exp.
Hawthorn Mellody Farm, Libertyville, Ill.

RES. JR. CHAMPION SOW
1949 Wisconsin State Fair
Marvin Klaehn, Burlington, Wisc.

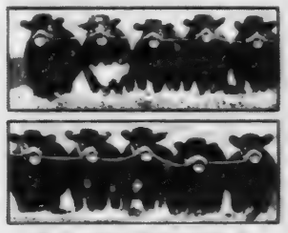
GRAND CHAMPION BARROW
1949 Wisconsin State Fair
Don Lang, Beloit, Wisconsin

GRAND CHAMPION STEER
1948 American Royal
Kenneth Eitel, Greencastle, Mo.

CHAMPION SHORTHORN STEER
1949 Iowa State Fair
Ross Christenson, Stanhope, Iowa

SR. CHAMPION BULL
1949 Michigan State Fair
Rye Brothers, Avalon, Wisc.

GRAND CHAMPION SOW
1949 Wisconsin State Fair
Chas. H. Batterman & Sons
Fond du Lac, Wisconsin



BEST 10 HEAD SHORTHORNS
1949 Amer. Royal & Int. Livestock Exp.
Edellyn Farms, Wilson, Illinois

These winners are typical of thousands of farmers, young and old, who depend on the Wayne Way of feeding year after year for top results and profits...in show ring, feed lot or market place.

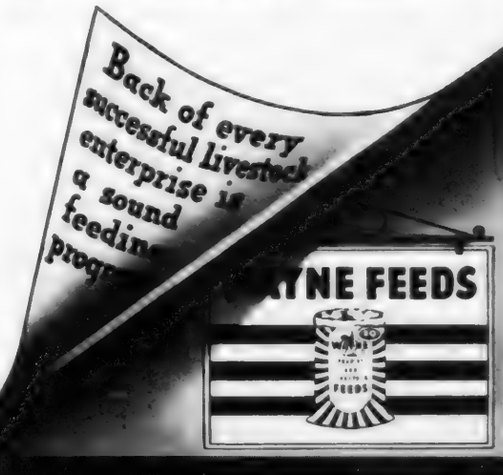
Prove to yourself... IT PAYS TO FEED THE WAYNE WAY!

The successful experiences reported above are a tribute to *quality* breeding, feeding and management. You, too, can profit—in show-ring or feed-lot—by feeding the Wayne Way. See your friendly Wayne Feed Dealer now—or send coupon below.

Allied Mills, Inc., Ft. Wayne 1, Indiana
Send free feeding information on:

Chickens ☐ Turkeys ☐ Calves ☐
Hogs ☐ Dairy Cows ☐ Beef Cattle ☐
..... ☐
(other)

Name.....
Address.....
Town..... State.....



Made by this New Automatic Baler

Compare the wire knot tied by the new, completely automatic Oliver Model 8 . . . *with all others!* Then figure out the savings in feet . . . and *dollars.*

This short, tightly twisted, firm-holding knot averages only 1½ inches in length. What's more, the knot is turned in—*toward the bale!* No scraggly ends protrude to tear clothing or flesh. There are no "clippings" or short pieces. *No wire is wasted.*

And, when it comes to baling speed, the Oliver Model 8 will equal the output of any automatic machine made! It's *tons per day* that determine a baler's real capacity!

Yes, *compare* the completely new Model 8 with all others before you buy. Examine the compact, simple tying mechanism. Inspect the tie. Check the sturdy, "straight through" frame construction, full-floating pick-up, synchronized feeding units, "big beat" feeder head and the "top shear" that produces sliced bales. The Oliver Corporation, 400 West Madison Street, Chicago 6, Illinois.

OLIVER

"FINEST IN FARM MACHINERY"

The Oliver wire tying mechanism is so simple in design you can thread the shuttles and knotter in less than 5 minutes! Units are enclosed . . . fully protected. Servicing is easy, too. To detach the knotter or shuttle gearbox, simply remove the four bolts that hold each in place.

The OLIVER Corporation F3-6
400 West Madison Street, Chicago 6, Illinois

Please send folder describing the new Oliver Automatic Wire Tie Model 8 Baler.

Name.....

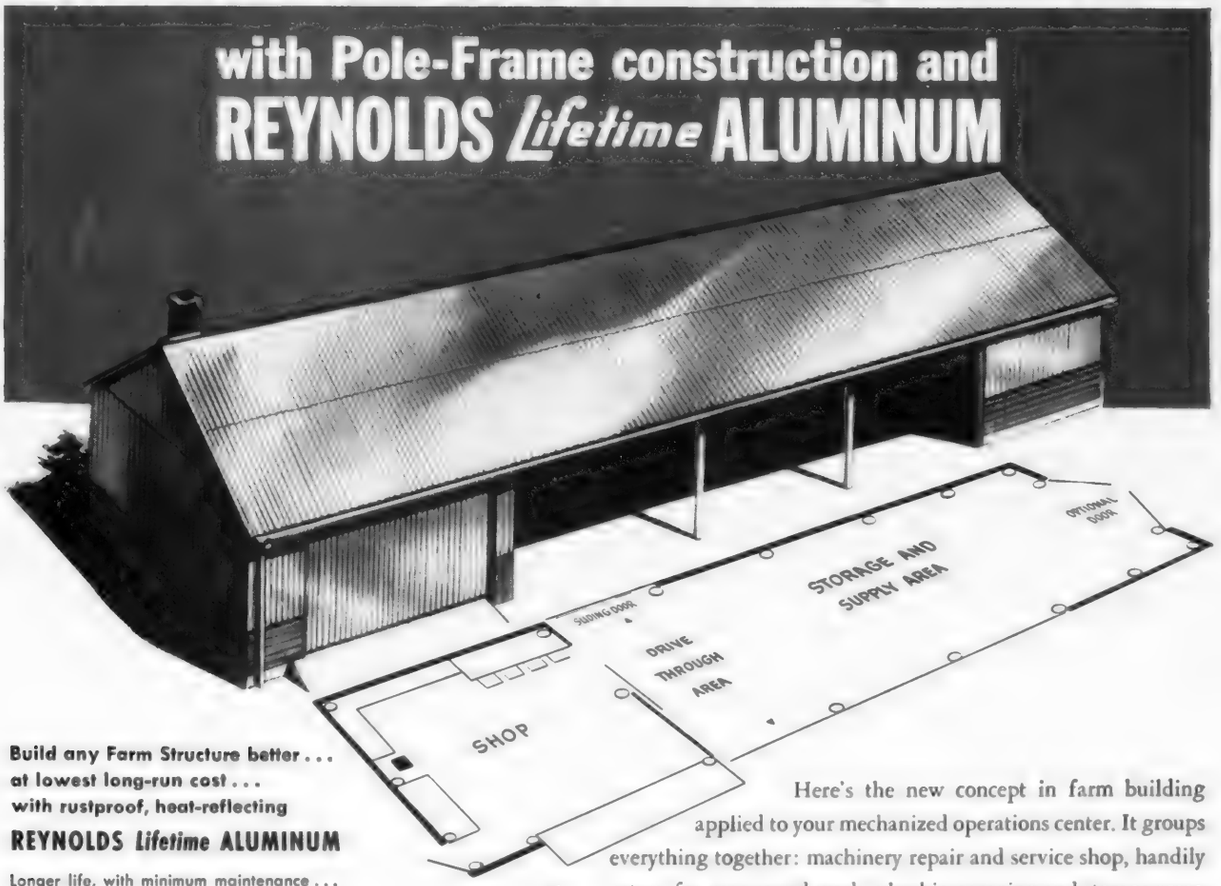
Post Office.....

Rural Route.....*State*.....

I farm.....*acres.*

Build this complete modern "MACHINERY CENTER" ...AT HALF THE COST of an ordinary machine shed

with Pole-Frame construction and REYNOLDS *Lifetime* ALUMINUM



Build any Farm Structure better... at lowest long-run cost... with rustproof, heat-reflecting

REYNOLDS *Lifetime* ALUMINUM

Longer life, with minimum maintenance... no protective painting needed! Heat reflection keeps interiors up to 15° cooler in summer... increases poultry and milk production. See your dealer! For built-up roofs, ask for Rey Kool 19" Selvage—aluminum bonded to asphalt felt, in rolls. Insulate with Reynolds Aluminum Reflective Insulation.

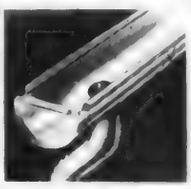
Your choice of smooth or stipple-embossed finish in

CORRUGATED

5-V CRIMP

WEATHERBOARD SIDING

GUTTERS AND DOWNSPOUTS



Here's the new concept in farm building applied to your mechanized operations center. It groups everything together: machinery repair and service shop, handily set up for year-round work, plus big garaging and storage areas. You'll be truly amazed at the time-saving and labor-saving ideas packed into this building. It is quick and economical to erect. Just set the chemically treated poles 4 feet in the ground—and nail the rest. No excavations, footings or foundations.

Developed by the Doane Agricultural Service, this building is the second of a series of modern farm designs made available as a service of Reynolds Farm Institute. For detailed plans, directions for construction, list of materials and sources for treated poles, send $5.00 with the coupon.

FARM INSTITUTE

Reynolds also serves the farmer with Aluminum Cable (ACSR), Portable Irrigation Pipe, Siphon Tubes, Paint Pigment and Freezer Foil.

For Building Plans for this Machinery Center, send $5.00 with the coupon. Or check coupon for more information. If you missed first building of this series, the labor-saving Barn, check coupon for FREE literature.

Note the "Aluminum Adaptor Plan" offer—it's for use with any U. S. Dept. of Agriculture drawings. And you'll want that 8-page catalog!

Reynolds Metals Company
Building Products Section, Louisville 1, Kentucky

REYNOLDS FARM INSTITUTE, Box 1800, Louisville 1, Ky. S-5

Please send me ☐ FREE "Aluminum Adaptor Plan" ☐ FREE 8-page Catalog of Aluminum Farm Building Products ☐ More information on Machinery Center ☐ Literature on Labor-Saving Barn

I enclose $5.00 (check, cash or M.O.) for which please send me full set of Machinery Center plans.

Name_____

Address_____

You are Invited TO EXHIBIT

Dairy animals in International competition, feed and barn equipment to a ready market, or food products to thousands of homemakers, at

THE WORLD'S FAIR OF THE DAIRY INDUSTRY

$56,000 in Premiums

★ International Senior Judging Shows for Seven Dairy Breeds, in open competition.

★ International Invitational 4-H and FFA Junior Judging Shows and Contests.

★ Special Educational Exhibits from Dairy Industry Processors, Manufacturers, Research Authorities.

★ "Festival of Dairy Foods" Program and Exhibits, Featuring Dairy Products for the Health of All.

★ Brilliant Evening Entertainment, International Hippodrome Acts in the 10,500 Seat Coliseum.

For complete information, write to
130 E. Washington St., Indianapolis 4, Indiana

Dairy

GIVE THE DEVIL HIS DUE

Sir:

Under the article "How to Benefit from Price Supports" (Spring 1950) above the picture on page 26, I read "Damage to grain in a sealed granary is charged against the frmer unless caused by an act of God."

If you have a Bible, turn to the Book of Job, 1st chapter, 12th verse, also second chapter, sixth and seventh verses which plainly declare that Satan, not God, is the cause of all our trouble.

If you will read your Bible you will see that God never destroyed anything without properly warning the people, as in Noak's Day they were warned 120 years but did they listen? No! That is only one of the many warnings throughout the Bible. So why blame God for something He does not do?

Now look at Revelation 12-12 which reads: "Woe to the inhabitants of the earth and the sea, for the Devil is come down unto you, having great wrath, because he knoweth that he hath but a short time." Now don't you think that should have read "The Act of Satan" instead of God?

Chadwick, Ill. — Abein W. Meyer

BILLY WYMAN'S HORSE

Sir:

My four children look for each Farm Quarterly issue nearly as much as I do.

The second boy said he thought Farm Quarterly needed a picture of Billy Wyman his riding horse "Candy" (part morgan) and his dog, Holstein, just coming down from their mountain on his father's one thousand acre farm.

Since the children were very small they have run out in the pasture to say hello to Candy, and even with all their other pets on the farm Candy is still a pretty swell horse.

Brandon, Vermont — Frederick G. Wyman

WHO FOUND SWEET CORN?

Sir:

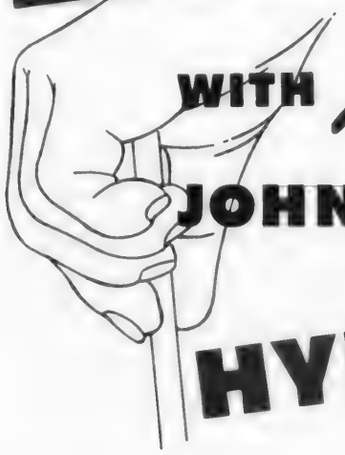
I was just looking over your beautiful Farm Quarterly which just arrived when I came upon the article on page 55 titled "Sweet Corn" by George Laycock. I was a bit surprised when I learned that Lt. Richard Bagnall first introduced sweet corn to white men in 1779. Allow me to point out that by the year 1779, sweet corn was well known in America and Europe. Mr. Bagnall is about 287 years away from the actual truth. I went to the trouble of looking up just who was the first white man to introduce sweet corn to the civilized world—it was Columbus in 1492.

I have done a lot of traveling in my day and have never yet been offered "roasted ears of sweet corn." On the other hand, I've eaten a lot of sweet corn on the cob which had been boiled. Down south, sweet corn is known as "roasting ears" but they always boil it. To my way of thinking, the term "roasting ear" is a misnomer. It is never used West of the Rockies, we call it "corn on the Cobb."

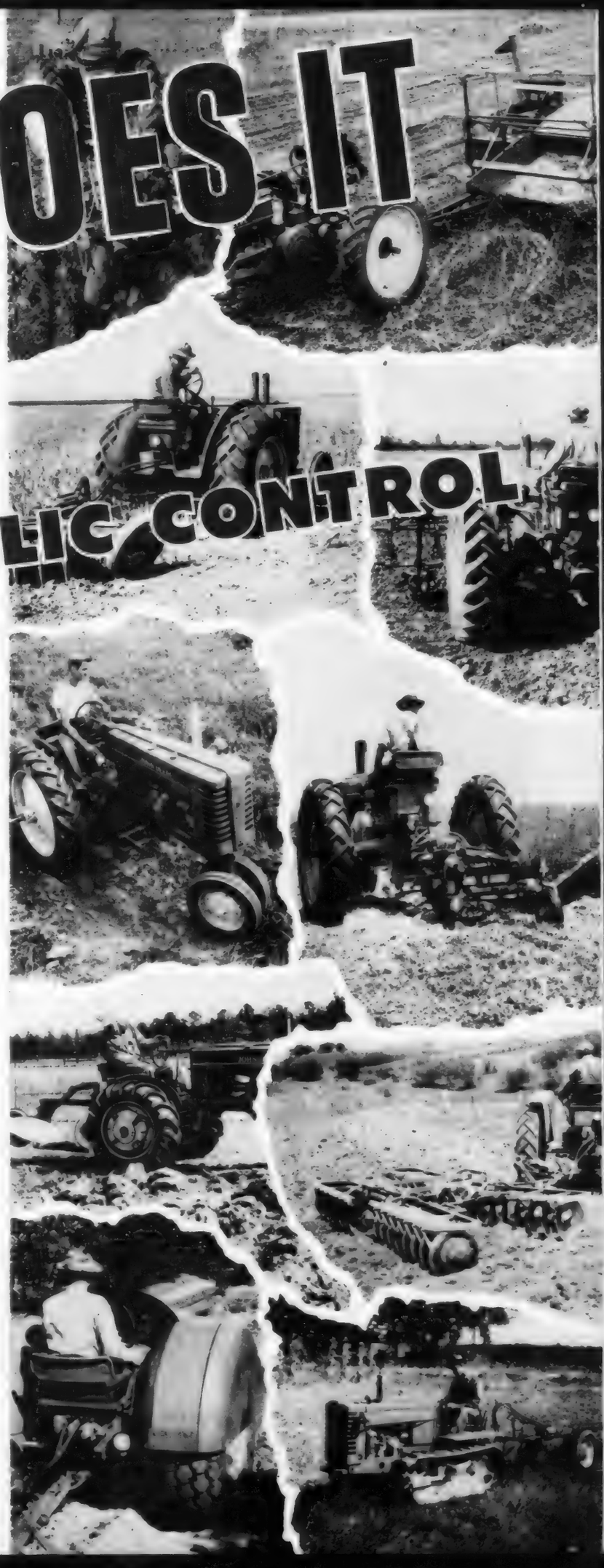
Salt Lake City, Utah — David H. Mann

Mr. Mann may have a point on whether or not "roasting ears" are "roasting ears." But we must come to the defense of Lt. Bagnall who, for obvious reasons can no longer defend himself. Mr. Laycock points out that the 1937 Yearbook of Agriculture carries a report of Bagnall's contribution. He also calls attention to the second sentence in the second paragraph of our article, "White men had already (in 1779) made dent corn an important item in their diet, but to them sweet corn was still unknown." Columbus did take corn to Euorpe, but apparently reader Mann failed to make a sharp distinction between sweet corn and "field" corn. Ed.

EASY DOES IT



WITH *proved* JOHN DEERE HYDRAULIC CONTROL



Control of tractor equipment has passed from man's biceps to his fingertips, thanks to John Deere pioneering and leadership in harnessing hydraulic power.

In 1933, John Deere introduced the first hydraulic lift to raise and lower integral tools. In 1945, came John Deere Powr-Trol—the first tractor hydraulic system to provide accurate, effortless control of *both* integral tools *and* drawn machines.

Today, each of 17 great John Deere Tractors is available with a specially-designed and fully field-proved hydraulic system to provide effortless control of the widest variety of equipment.

Available for John Deere "A", "B", and "G" Series General-Purpose Tractors, and for the Models "MC", "AO", "AR" and "R" Diesel.

Single control is standard on the one-row John Deere Model "M"; dual control for the two-row "MT".

Easy Does It. And, because it is easy, you move along faster, do more work in a given time. There's no bogging down in sand or mud, no slowing down in tough spots. Just touch a single lever to ease the load and go right on through.

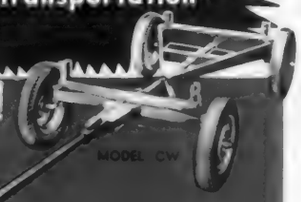
Equally important, you do better work on *every* job because you adjust angle, depth, or height of working equipment instantly and accurately to meet varying field or crop conditions.

First yesterday, foremost today, John Deere Hydraulic control is just one of many reasons why your next tractor should be a John Deere. See your John Deere dealer or write to the address below for free booklet entitled, "Easy Does It."

JOHN DEERE
MOLINE, ILLINOIS

JOHN DEERE
QUALITY FARM EQUIPMENT

Converto first in farm transportation

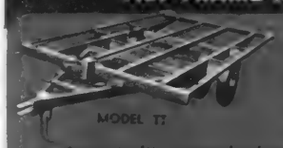


all purpose farm wagon!

Won't twist, easy to handle, easy to back. Features automotive steer, rocking bolster, heavy gauge steel construction. Short turning radius. Adjustable stake guides for 38" or 42" box. Rear truck can be used independently as 2-wheel trailer. Built to really take it.

MODEL CW

TILT FRAME IMPLEMENT TRAILER



MODEL TT

Cut hauling time and costs! Here's the perfect teammate for hay rack, ensilage box, pickup baler, bale loader, etc. Ideal for hauling all kinds of equipment. It's rugged, durable—eliminates jockeying under "A" frames. No special hoists.

SINGLE or DUAL WHEEL TRAILER WAGON

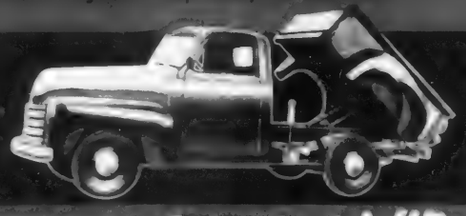
MODEL FT

Single or dual wheel model available. This trailer wagon of 100 uses features low mounting design making bed easy to mount. Wheel discs can be turned in or out for wide or narrow track. It tilts, has extra strength, extra capacity. Takes from 10' to 14' regular platform or box type bed. Inquire today!

UTILITY TRAILERS

MODEL TD

Built for all kinds of hauling, these trailers have large capacity: 48" floor width, 72" length, 14½" height. Bodies are made of 11 gauge steel. Reinforced, one piece tailgate. Wheels are standard interchangeable automotive type. Two models: Cargo and Dump. Every farm needs one.



CONVERTO hydraulic picUPac

Cut costs! Convert any conventional pick-up truck up to one ton capacity into a dump truck. 6,000 lbs. load lifting capacity. Quick, easy installation. Hand hydraulic operation.

Optional at extra cost is the electrically driven, cab operated Blackhawk "Power Packer" Pump. Stands up under the toughest of fast dumping jobs.

portable slip-in DUMP BODY

MODEL A

Another Converto time and money saver. Light weight, portable. Can be installed in conventional pick-up bodies of your choice—also platform type. No attachments; simple, hand cranked mechanism. It just "slips" in. Fast dumping action. Quick one-man installation.

Converto MANUFACTURING CO. CAMBRIDGE CITY INDIANA

Please send me at once your FREE Farm and Automotive Equipment Folders.

Name .....

Address .....

City..... State.....

The Poultry Yard

A REVIEW OF FACTS AND FINDINGS CONCERNING MANAGEMENT OF THE POULTRY FLOCK AND THE USE OF POULTRY REMEDIES.

Lindane for External Parasites. Benzene hexachloride (BHC), originally hailed as the answer to the problem of external parasite control, was found to produce off-flavors in eggs and in poultry meat as well. Researchers have now discovered, however, that one of the ingredients of this compound, lindane, is more adaptable than the original product.

Lindane, chemically called the "gamma isomer" of BHC, is practically odorless and possesses even higher insecticidal properties than commercial BHC. It is highly recommended for the control of poultry lice, mites, ticks, flies and other insect pests found on poultry and in poultry houses. Lindane is available in the form of a wettable powder which can be used as a dip, dust or fumigant. It is not water-soluble.

Two factors governing the successful use of any insecticide are the parasites to be controlled and the percentage of active ingredient in the product purchased. The manufacturers' label will give the answer to both of these factors. The wise buyer will study the label formula and compare the percentage of lindane (or whatever other *active* ingredient is marked on the label) before purchasing to make certain he is getting the most for his money.

ROTTEN EGGS are culled by candling, others will make balut.

Balut Duck Egg Delicacy To the Tagalog people in Manila, balut is as popular as hot dogs at an American baseball game. This duck-egg delicacy was little known to the rest of the world, until American soldiers discovered it during World War II. It has developed into one of the most

(Continued on page 141)

"Don't let its light weight fool you!"

THIS ROOF LASTS!

No reason why a roof should weigh a "ton per square". When you buy roofing you're looking for lasting protection and freedom from repair rather than weight.

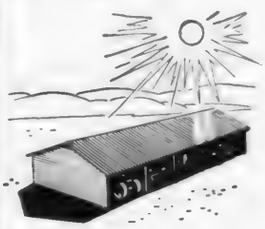
You'll count the light weight of Alcoa Roofing a mighty big advantage when you figure the lighter load the roof will put on your barn or shed—and when you're putting this lighter roof on!

Because it's corrosion-resistant Alcoa Aluminum, through and through, Alcoa Roofing Sheet never needs painting, can't rot or burn. And it's the strongest aluminum farm roofing, gauge for gauge, on the market.

Ask your dealer for long-lasting Alcoa Aluminum Roofing Sheet. It is available in all popular types, thicknesses and finishes with a complete line of accessories. For detailed information and easy-to-use application instructions, mail the coupon below.

EASY TO PUT ON

Alcoa Aluminum Roofing—in sheets up to 12 feet long—goes on easily. Weather-resistant aluminum, put on with long-lasting aluminum nails, ends roofing work and worries.



COOLER BUILDINGS
HEALTHIER STOCK

Farmers tell us that Alcoa Roofing keeps buildings up to 20 degrees cooler on hot summer days. This means that flocks and herds stay healthier—feed better.

ALL TYPES • ALL ACCESSORIES

Make your choice of Alcoa Roofing Sheet from two thicknesses—.019" (equal to 26 gauge) and .024" (equal to 24 gauge), two finishes—plain or embossed—and three popular styles shown above.

BUY WHERE YOU SEE THIS SIGN

The dealer who displays this sign sells Alcoa Roofing and all accessories for a good roof—ridge roll, flashing roll valley, and aluminum nails. See him for complete roofing information.

ALCOA ALUMINUM
ROOFING SHEET

ALCOA ALUMINUM ®

Also look for Alcoa Aluminum in Sprinkler Irrigation Systems, Sprayers and Dusters, Aluminum Paint, Screening, Lightning Rods and other modern farm equipment and materials.

MAIL THIS COUPON TODAY

ALUMINUM COMPANY OF AMERICA
1452F GULF BLDG., PITTSBURGH 19, PA.

Please send me the free booklets on Alcoa Aluminum Roofing and instructions for proper and easy application.

Name_____

Address_____

City (P.O.)_____ State_____

My building supply dealer is_____

The Dairy Barn

A BRIEF SUMMARY OF THE NEWEST DEVELOPMENTS IN DAIRYING AND THE CARE OF DAIRY CATTLE.

How To Get Cows Out Of Silos It isn't every day that a farmer is called on to remove a cow from a silo, but farmer Everett Lampman, of Osceola, Wisconsin, can testify that the need does, on occasion, arise. Lampman recently had to figure out a way to remove an 18-month old, 650 pound heifer from his empty silo.

The heifer, which Lampman named "Snoopy," plunged into the silo to escape the attentions of a bull. The silo door measured 21 by 29 inches. It was 12 feet from the door to the concrete floor below.

For a few days Lampman didn't know how he would solve his problem. He finally decided that the best plan was to start filling the silo. The corn was ready for harvest. As the silage piled up, Snoopy helped tramp it down, all the while gorging on the succulent stover. Eventually she stood level with the silo door. Snoopy walked out, a sadder but wiser heifer.

Housebreak Your Cows Cows are hard to housebreak. They have little regard for the rules of hygiene, and consequently the dairyman spends a large fraction of his chore time cleaning up behind his animals. A. M. Einerson, of the University of Wisconsin, got tired of being a cow's chambermaid, so he figured out a way to make cows keep their own stalls clean.

Hanging above each cow's shoulders is a piece of wire that looks like a cheap clothes hanger. These are connected to an electric fence controller. If a cow, in making preparation to relieve herself, humps her shoulders while standing too far forward in the stall she touches the wire, gets a slight shock and backs up; the manure falls in the gutter.

The major advantages are cleaner milk and less chore time required to clean stalls

(Continued on page 18)

How did Snoopy get out?

BUTLER STEEL BUILDINGS
For Farm Use

Better Protection
for valuable stock, grain and equipment. BUTLER Steel Buildings are weathertight, rodent proof, and fire safe.

Useful for Many Purposes
BUTLER Steel Buildings are easily adapted for any farm purpose. Ideally suited for use as barns, storage buildings, or shelters for high cost tools and implements.

Trim Appearance
The clean, trim exterior appearance of BUTLER Steel Buildings will harmonize perfectly with the other buildings on your farm. Their steel construction assures you *low* maintenance and insurance cost.

Less Cost to Construct
You gain the big cost advantage of mass fabrication . . . precision formed parts fit perfectly—no field modification required (unless for special adaptation) . . . complete building is delivered—no expensive delays in purchasing materials from several suppliers. Minimum of foundation work.

Easy to Erect
BUTLER Steel Buildings go up in a matter of days instead of weeks. Your local Butler distributor will give you quick, expert erection service. He will be glad to help you with erection problems.

Range of Sizes
BUTLER Steel Buildings are available in a wide range of sizes to meet your specific needs.

BUTLER MANFACTURING COMPANY
Kansas City, Mo. • Galesburg, Ill. • Richmond, Calif. • Minneapolis, Minn.

For Prompt Reply, Address Dept. Q27
7378 East 13th St., Kansas City 3, Mo
978HH Sixth Ave., S E., Minneapolis 14, Minn
Dept. TTT, Shipyard No. 2, P. O. Box 1072, Richmond, Calif.

Please send name of distributor and information on Butler Steel Buildings to be used for _____

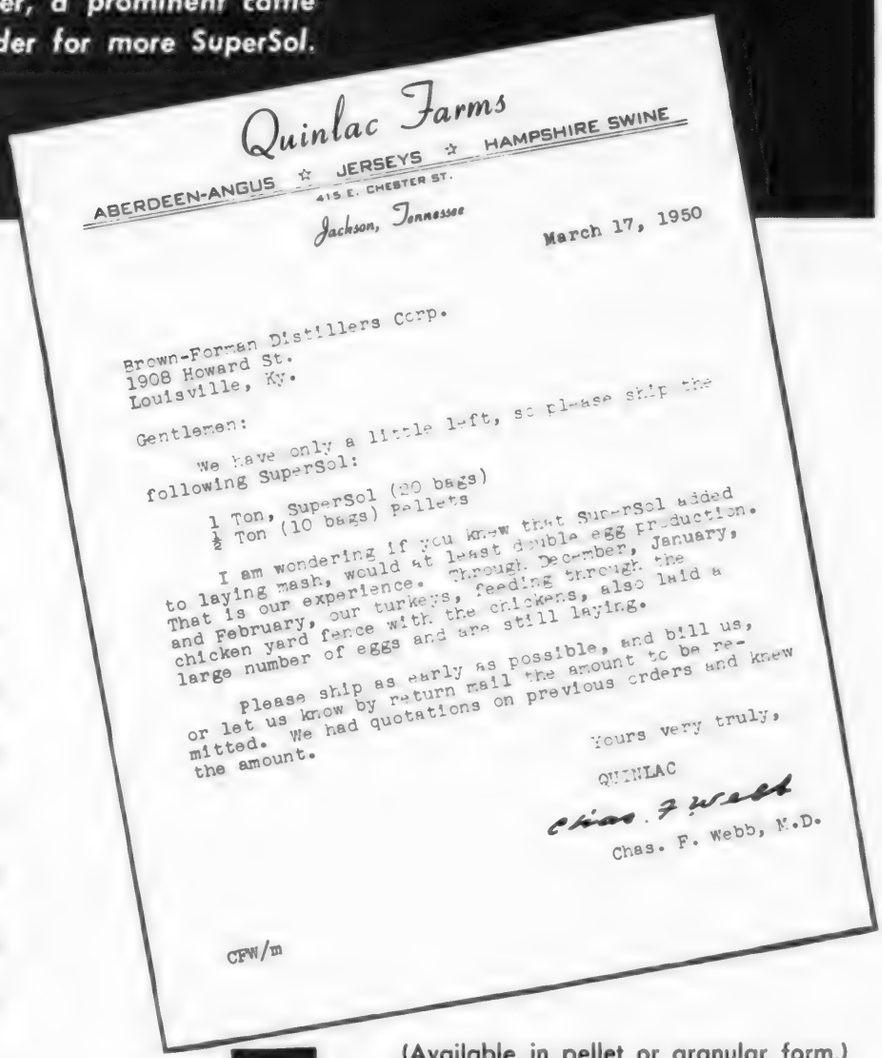
Name _____

P. O _____ RFD _____

State _____

What's Good for the Goose...

...seems equally good for the gander, judging from the unsolicited testimonial this feeder, a prominent cattle man, attached to his recent order for more SuperSol.



Quinlac Farms

ABERDEEN-ANGUS ☆ JERSEYS ☆ HAMPSHIRE SWINE

415 E. CHESTER ST.

Jackson, Tennessee

March 17, 1950

Brown-Forman Distillers Corp.
1908 Howard St.
Louisville, Ky.

Gentlemen:

We have only a little left, so please ship the following SuperSol:

1 Ton, SuperSol (20 bags)
½ Ton (10 bags) Pellets

I am wondering if you know that SuperSol added to laying mash, would at least double egg production. That is our experience. Through December, January, and February, our turkeys, feeding through the chicken yard fence with the chickens, also laid a large number of eggs and are still laying.

Please ship as early as possible, and bill us, or let us know by return mail the amount to be remitted. We had quotations on previous orders and knew the amount.

Yours very truly,

QUINLAC

Chas. F. Webb

Chas. F. Webb, M.D.

CFW/m

Yes, Dr. Webb, we have had similar results called to our attention before.

We also know from far more extensive experience, our own and that of some of the country's foremost feeders of fine stock, that B-F Super-Sol included in the rations of cattle will assure better appetite, fleshing, finishing, bloom, settling, and calving.

Our FREE BOOKLET will tell you what SUPERSOL will do for your livestock.

Write

FEED DIVISION
BROWN-FORMAN
DISTILLERS CORPORATION
at
LOUISVILLE IN KENTUCKY

BETTER B-F FEED

BROWN-FORMAN

SUPERSOL

BEEF SUPPLEMENT

(Available in pellet or granular form.)

PROVIDES

true VITAMIN A
VITAMIN D

B-GROUP VITAMINS
RIBOFLAVIN, THIAMIN
NIACIN, CHOLINE, PYRIDOXINE, PANTOTHENIC ACID,
p-AMINOBENZOIC ACID
BIOTIN, FOLIC ACID

FATS and PROTEINS
CALCIUM, PHOSPHOROUS
and ESSENTIAL TRACE MINERALS

plus **VITAL PRODUCTIVE FACTORS**

MINRALTONE HELPS BUILD CHAMPIONS

This appealing mother-and-daughter combination is typical of the healthy, productive cattle protected year round by MinRaltone feeding. They're typical of the fine Hereford herd at the Melton Hereford Ranch, Gainesville, Fla.

Melton Hereford Ranch Herd
Protected Against
HIDDEN HUNGER*

Mr. A. E. Melton (shown at left) is the owner of noted Melton Hereford Ranch. It's an 830-acre ranch, with 160 head of polled and horned Herefords (half and half).

Mr. Melton says, *"We've been feeding MinRaltone for 2½ years now, giving the herd free access to it. We have found that it helps mature animals maintain top condition — and this, of course, is fundamental to a good breeding program. MinRaltone is a big help to us in keeping our calf crop up."*

What MinRaltone will do for one breed, it will do for all. Follow the lead of successful stockmen — feed MinRaltone regularly, year round. MinRaltone protects against Hidden Hunger* because it contains 11 essential mineral elements with Vitamin D. Write for free MinRaltone feeding booklet and complete details.

NEAR'S FOOD CO., INC. • BINGHAMTON, N.Y.

Plants in Binghamton, N.Y. — Forsyth, Ga. — Chicago, Ill.

*HIDDEN HUNGER — Lack of essential mineral elements needed by livestock for sturdy health, rapid growth, peak production and reproduction.

NEAR'S
MINRALTONE

HEALTH - PRODUCTION - PROFITS

WM. F. RENK & SONS
Our 1949 International Winnings Suffolk & Hampshire Sheep
Champion Suffolk Ram Champion Suffolk Ewe Champion Hampshire Ewe
ANNUAL SALE, MONDAY, JUNE 19, 1950
PLEASE WRITE FOR CATALOG SUN PRAIRIE, WISCONSIN

THE DAIRY BARN

(Continued from page 16)

and cows. There is one other advantage, however, which Einerson thinks is important. Dairymen have known for years that cows are more comfortable in longer stalls than those they ordinarily have. They can lie down without hanging over the edge and there are probably fewer injuries and less mastitis. The electric trainer permits the use of long stalls. Einerson concluded that with his trainers cows can be kept as clean in six foot stalls as they can in five and a half foot stalls not equipped with trainers.

The Wisconsin herd on which the trainer was tested included 17 Holsteins as alike in temperament, size, and stage of lactation as possible. They were tested for 28 days. Daily observations were made on the cleanliness of stalls and the cows themselves. The results proved promising enough to cause Einerson to predict that dairy barn structure will undergo changes to accommodate longer stalls. The cost of installing the trainers, aside from the controller, runs between one and two dollars per head.

Progress Report On X Disease

In Autumn 1949, a report on X disease appeared in this column. The disease was then a little understood newcomer among cattle diseases. Now there comes out of Johns Hopkins University a report that this disease which is apparently not contagious, may be linked with some of the trace elements. They emphasize that such suggestions are still little more than guesses.

X has shown up only in the past ten years, but has spread rapidly and killed more than half of the cattle struck by it in some 32 states. There is no known cause or cure for the ailment. But in the past few months scientists have been making some observations on the disease which may eventually reveal its cause and suggest a cure or prevention.

There was the case where a farmer had rented pasture from a neighbor whose cattle had died from X disease. Three months later the renter's cattle started to die of the same disease. Three were attacked by it and the remaining 17 were moved immediately to other farms. None of the 17 contacted X. There have also been cases where cows in one field are attacked by the disease while those across the fence in adjoining fields go unharmed. These conditions prompted the scientists who are studying the puzzler to ask if something in the soil, perhaps the trace elements, might be doing the dirty work. Our land management practices have changed radically within the past ten years and perhaps in some, as yet, unknown way we have upset the delicate balance in trace elements. This may be a step forward in the solution of the X disease problem, but the scientists hasten to add that there are no suggestions for treating

(Continued on page 140)

Make a Date with a "Rocket 8"!

THE BIG NUMBER WITH THE NEW LOW PRICE FOR 1950

The hottest number on the highway—
the most talked about car in America—
that's the famous Oldsmobile "88"!
Now at an even lower price for 1950!
"Rocket" Engine action—most thrilling ever!
Futuramic styling—fleet, smart, distinctive!
Whirlaway Hydra-Matic*—superbly smooth!
Now all yours at the lowest cost ever!
Take a demonstration drive tomorrow.
Just call your Oldsmobile dealer and . . .
make a date with a "Rocket 8"!

Compare it with any other car on the road for performance—for driving ease—for *value*. You'll be dollars ahead when you rocket ahead in Oldsmobile's "88"—*at 1950's new low price!*

OLDSMOBILE

**Whirlaway Hydra-Matic Drive, at reduced price, now optional on all Oldsmobile models.*

A General Motors Value

PARAGON
SPRAYER

Handles 12 gallons of any spray solution. Kills pests and parasites on plants, trees, poultry and livestock. Destroys weeds. Whitewashes buildings. Automatic agitation prevents solution from settling in tank or clogging nozzles.

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FARM BOOKS

Out of the Earth, *by Louis Bromfield Harper and Brothers, New York $4.00*

When Louis Bromfield writes fiction he often recreates the exotic, to us unbelievable, far away lands of India and Europe. When he writes about his farming experiences he uses his imagination to put the provable truth into unforgetable language. Often accused of being a good farmer only because he has plenty of money to sink into his Malabar Farm, Bromfield uses this present book to meet his critics head-on and lay his farming practices and beliefs on the line.

LOUIS BROMFIELD at Malabar Farm.

Farmers who have read *Pleasant Valley* and *Malabar Farm* with a feeling that Bromfield was giving them kindergarten stuff should take to this new book. Bromfield admits that those books were written " to lure readers who never had any interest in agriculture or whose interest had been dulled or killed by pamphlets bearing such names as *Some Preliminary Observations of Phenological Data as a Tool in the Study of Photoperiodic and Thermal Requirements of Various Plant Material.*" Here he tells what he as a farmer has learned from his land, from other farmers, and from the men of science. Farmers will find that much of what he says has been known by them for a long time or has been published elsewhere, but no one else has presented it with the imaginative punch of Bromfield, who makes of farming a thing of wonderful excitement.

Grass Farming

Two years ago the United States Department of Agriculture used *Grass* as the title and subject for the Yearbook of Agriculture. Since then a deluge of books on pasture and forage crops have been published.

(Continued on page 142)

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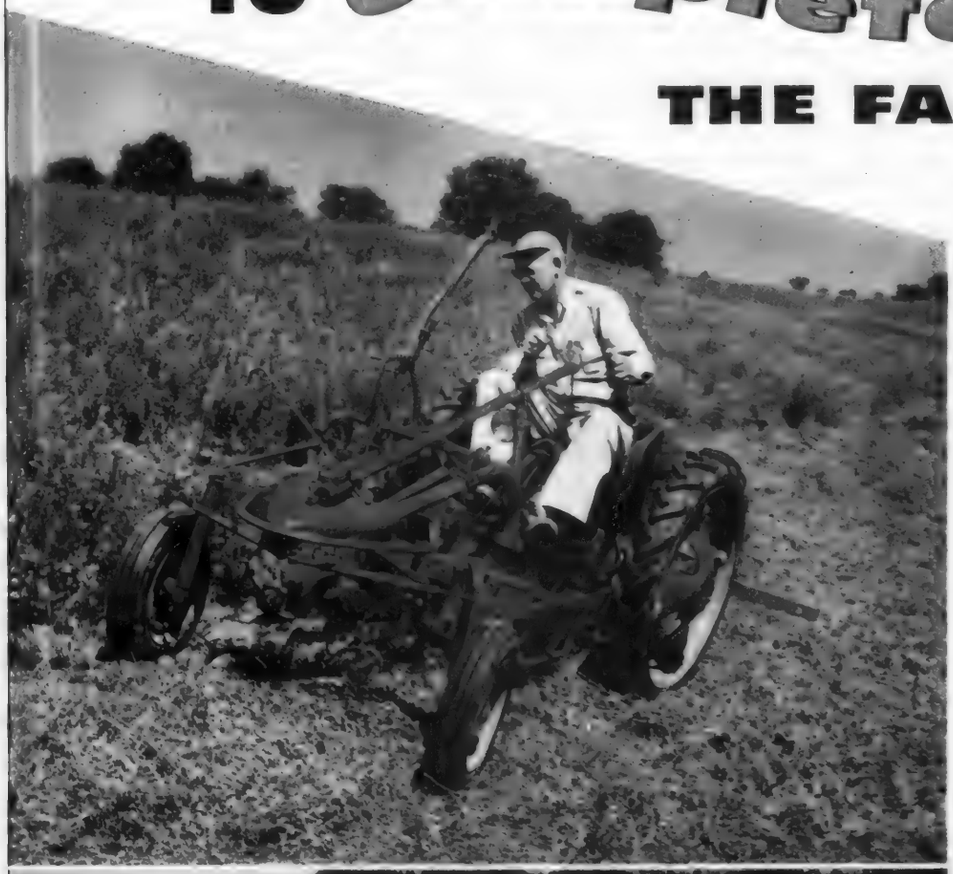

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THE FIELDS OF THE OTAVALOS CLIMB THE SLOPES of the Andes in terraced steps built during the Inca empire. In the high fields are the crops of the temperate zones; in the lowlands the semitropical crops; altitude takes the place of seasonal change for these people who live on the equator. Except for the addition of the ox and the iron shod wooden plow their agricultural tools and methods have changed but little in a millennium of time; their deep love of the land has changed not at all.

FIELDS in the CLOUDS

BY JOHN COLLIER, JR.

Dispossessed of their rich valleys, the Otavalo Indians of Ecuador farm the thin slopes of the high Andes.

AS the sun dips below the jagged peaks, a moist, sharp coldness climbs out of the valleys and up the cultivated slopes of the Andes. The Otavalo children draw their blankets about them and snuggle closer to brothers and sisters. Over their windowless hut the Southern Cross wheels across the sky and the last wisps of smoke from dying hearth fires ascend straight upward in the thin air.

The Otavalo Indians live on the equator, but at 9,000 feet, in the shadows of the towering Andes, the days are mild all year round and the nights are always cold. This is the tropics, but not the tropics of the steaming jungle one finds in the low coastal areas only a few miles west in this ancient Inca land of Ecuador.

Beneath the peaks of Otavalo the waters of Lake San Pablo lie black, bottomless. Only the reflections of the stars shimmer on her quiet surface. All around her ten miles of marshy shore are communities of the Otavalo Indians: Pucará, Malespamba, San Roque Bajo, Caluquí, San Miguel, Gualacata, Araque, Abatag, Camuendo, La Compañía.

The night air bites in that coldest hour just before the dawn. Not a dog barks. Not the lowing of a single cow. Only the frogs break the stillness with their monotonous croaking. But within an Indian home people are getting up, poking each other in the ribs, yawning, trying to steal another wink of sleep. For the Andean farmer's day often begins

THERE ARE MUSIC AND DANCING at the fiesta of San Juan. Otavalo musicians play their own native reed flutes and silver horns brought from across the seas.

in the darkness. Before the dawn the Indians leave their thatched huts for their fields upon the mountain. Life is stirring now in the shadow. A cock crows in a tapering eucalyptus tree. From the interior of the house comes the "cuí, cuí, cuí!" of the family's guinea pigs, the mew of a kitten, the cry of a child, as the family readies itself for departure.

Miguel Maldonado and his family are rising earlier than their neighbors, for today they are planning to plow their field at the very top of the Indian farm land on Mount Imabura—eleven thousand feet above sea level, more than two thousand feet above the valley floor.

The Inca Empire

The Otavalo Indians have been farmers from the dawn of archaeological time. At the time of the Spanish conquest they were a part of the Inca Empire which stretched from northern Argentina all the way to the borders of Colombia, a nation two thousand miles in length with a population of many millions of people who lived entirely by intensive agriculture. Overlords of the empire administered this vast agrarian state with scientific efficiency. Regions of drought were supplied with produce from regions of plenty. More than its gold, the wealth of the empire was its carefully cultivated fields.

Agriculture was not only the economy of the Incas, but a way of life. The sun, which brought growth from the soil, was their most sacred symbol, and planting and harvesting the richest ceremonies of their religion. Soil conservation and the arts of terracing and irrigation were developed into a science that even today draws researchers from all over the world to study the crumbling mountain terraces, the vast systems of irrigation, parts of which are still in use.

The Spanish conquest eclipsed this amazing civilization, but not the vitality of the Andean Indians. The Otavalos still farm with the zeal of their ancestors. Here the roots of ancient Indian culture flourish.

The energy of the Otavalo Indians has won for them a sure footing in the economy of modern Ecuador. Four hundred years ago the conquering Spaniards dispossessed the Otavalos of most of their high, fertile valley in northern Ecuador, leaving them with only mountain land to farm. But over the years, the devotion of the Indians to their land has won them back portion after portion of their lost heritage, until today they are once more becoming the owners of the valley.

But in a subsistence agriculture, farming alone cannot buy land. For generations the Otavalos have accumulated meager savings by working on the Spanish haciendas at a slave's wage; they have descended from their snow-capped mountains to the fetid tropical coast to work on the sugar plantation, where many have died of malaria and tuberculosis. Painfully and slowly they save to buy another acre in their beloved valley.

In recent years the Otavalos have turned successfully to textile crafts, fine blankets and tweed suiting—to earn money. Every penny of their profits goes back into the land, for to them the land is the paramount source of wealth. This is the direction of all their labor: to work to save to buy land.

Dawn to Dusk

Only a faint glow shines from the doorway of Miguel Maldonado's earth-walled home. A crude coal oil lamp flickers feebly as the family prepares to leave for their

THE PRIMITIVE PLOW is carried down the mountainside after the morning work. By noon the Indians will have reached home and started their spinning and weaving.

field on the mountain slope.

No one leaves empty-handed as they pass from the darkened dooryard. The father shoulders his wooden plow and drives before him two sleepy, softly-lowing oxen. The mother, María, carries a primitive hoe and a mattock. Pedro, the older boy, has a great cloth bundle of seed potatoes tied on his back. And the younger boy, Manuel, and the little girl, Rosita, carry bundles of parched corn and beans for breakfast in the field.

In their musical Indian tongue they speak softly, as if not to awaken the still sleeping world. Perhaps Miguel Maldonado is saying, "Hurry, hurry, everyone! The dawn is coming. Our field is very high. We must plow and plant before the sun is hot!" And as he speaks the sky turns from indigo to a sheet of pearl light behind the jagged peaks.

"Yes, hurry," repeats the mother. "We have many skeins of wool to spin today." So they press forward, their bare feet moving without a sound over the boulder-strewn trail.

Upward they climb in the chill mountain air. The valley below is lost in a lake of dawn mist. As they climb they seem to be passing the seasons as the northern farmer knows them. In the valley corn has just been harvested, further up the slope peas are green and lush, and in the uppermost fields the land lies in a zone of eternal spring, ready to be planted to crops that thrive in the chilly nights and cool days. Only the mountain tops rise sharp and clear above the rolling foothills where lie a patchwork of Indian fields. Higher than all the others seems the Maldonados' field. At last they reach its rocky terrace and fling themselves on the ground for a moment's rest.

"We must plow!" cried Miguel Maldonado, springing from the ground. "While the dew is still in the furrows we must plant the potatoes. We haven't all morning to loll in the sun. That's for the townspeople. That's for the tinkers and the hatters. Come on. Come!"

The wooden yoke of the iron-tipped plow is lashed to the horns of the oxen, and with a sharp jab of a pole the sleepy beasts begin their plodding course. Back and forth, back and forth they go, with the family moving in a busy procession, the father urging on the oxen, the mother and Pedro with mattock and hoe, breaking the clods thrown up in the furrows, Manuel dropping seed potatoes into the furrow, and little Rosita tamping down the seed with her foot.

Beneath their heavy ponchos, Miguel and the boys wear white cotton homespun shirts and short trousers that come midway between the knee and the ankle. Their long hair hangs down their backs in a single braid beneath their heavy felt hats.

YOU EAT WHEN YOU ARE HUNGRY if you are an Otavalo Indian. Only the white man is concerned about meals being punctual. The corn and potato soup is cooked in a big clay pot over a twig fire that is kept burning in a corner of the single room.

Rosita and the mother, too, are dressed alike. Their loose white blouses are gaily hand embroidered. Their dark blue skirts are simple pieces of wool wrapped around in ancient fashion and held at the waist by a broad and a narrow belt. Another piece of wool or cotton is knotted loosely around their shoulders, and on their heads they wear another cloth folded or tied in the manner of their community. All of them are barefoot.

With a hot breath the tropical sun rises, flooding the mountain with light. The last furrows are nearly plowed. Higher rises the sun, its burning rays drinking the night dew from the earth. At last the field is planted. The oxen are turned loose to graze, and the family sits down in a circle to eat the morning meal.

Everyone is busy cracking the parched corn and watching the morning mist lift from the valley. There is the town of Otavalo, the neat streets and plazas of the Spanish town where every Saturday the Indians gather for market. Down the mountain slope to the lake and up the mountain on the other side spreads the tight patchwork of tiny Indian fields. And in contrast, in the valley floor, lie the spacious fields of the haciendas.

"We climb so far to farm," exclaims Pedro as he reaches for another handful of corn. "Such fine fields there are in the valley—no rocks, no hills . . ."

"Yes, the valley is very fine," observes Miguel Maldonado with a long quiet look. "Our people once farmed all the valley, they say. But we always planted the hills. The mountain is our father, my son. Do not begrudge his rocky slopes. He gives us strength, food to make us strong. Every hill has a different taste, every higher field a different flower. We have fields down by the house for corn, and fields half-way up for peas and wheat. And look, here we plant the mountain potato. Only on the high slopes will such a fine food grow! The white people in the valley grow only corn, just corn. Only the Indians grow these fine little potatoes!"

Altitude and Seasons

A long speech for a quiet man! It was ancient wisdom learned from his father and now passed on to his son—this knowledge that the Indian has and the white man has not, the secret of nature. Altitudes are like seasons, that was what he was telling his son. For altitude is the blessing that alleviates the curse of the tropics. On the equator there is practically no change in temperature. Year in and year out the same crop grows again and again. Populations are stranded in crop belts. Only a change in altitude can alter their diet. A few thousand feet up the mountains there is another crop belt, where still another population lies stranded. Lack of knowledge of diet and extreme transportation problems leave the potato planters eating potatoes and the tropical fruit planters eating fruit.

The Indians of Otavalo plant their fields from the floor of their valley far up the mountains till altitude finally ends their ambitious agriculture. The lush bottom lands yield corn and peas and garden greens, the middle slopes wheat and barley and peas, and the highest fields the hard Indian grain, *quínoa,* and tiny, delicious Andean potatoes. So the year around they have the benefits of all the seasons, from spring to cold fall. Their diet follows this pattern, which gives them a robust health that the white people in the valley lack. The valley lands yield primarily cash crops for the big haciendas, and much of the food for the townspeople must come from other places at great expense. So the diet of the artisan and shop-keeper is likely a staple of bread and polished rice with a few eggs and beans. Their apathetic appearance and frail bodies are the marks of this diet. Only the Indians have the strength of the mountains.

The ancient Indian crops were surpris-

DRIVING A BARGAIN steer from the market, this barefoot woman throws a bag of groceries over her shoulder and climbs back to her village on the mountain slope.

AS IN BIBLICAL TIMES the grain is harvested with a hand sickle and threshed with a flail. Barley grows well on the high fields, too cold and dry for corn.

ingly well-balanced: corn, a cereal grain called *quinoa,* many types of melons and squashes, several varieties of potatoes, native beans, and a host of wild plants that were gathered from the mountains and the lake. As in most of the western hemisphere corn was, and still is, the Indians' staple crop. In Otavalo it thrives best on the valley floor where it grows large ears. But up the mountain slopes the yield decreases and it is seldom planted much above nine thousand feet. The native Andean grain, *quinoa,* which grows at very high altitudes, is a low-growing burnished-red plant with tiny round seeds which cook into a chewy cereal. The Andes are the probable place of the origin of the potato, for here the greatest variety of potato plants are found. Potatoes of all sizes, some as small as a peanut. Potatoes of all shapes and colors and textures—round, elongated, and scalloped; white, red, yellow, and purple; some mealy, some sticky, some glutinous. The Indian chooses the variety best suited for his soil and altitude. Other root plants are sweet potatoes, a native food plant for centuries, and carrots, both orange and white. Among the native beans is the *chocho* bean, tiny and white and very bitter unless cooked in many waters. There is also a multi-colored pinto-type bean that comes red, pink, yellow, blue, and

black—which cooks out like any other dull bean, a drab brown color. Then there is the *haba* bean, large like the lima but even meatier and tastier, its only disadvantage being its tough skin, which means it must not only be shelled from the pod but each individual bean peeled.

Indian agriculture has changed little in the four hundred years of Spanish domination. Wheat and barley, peas and various other vegetables were added to the rich assortment of Indian crops. European fruits were introduced but have not thrived. Few Indians bother about fruit trees. Only a little choke cherry is native to the region, and the European apples and peaches seem to have reverted and become equally hard and sour. More significant was the introduction of the European plow and iron and steel for tools, which the Indians readily adopted.

In Otavalo European livestock has been adopted only in part. Every Indian owns or borrows oxen for cultivation, but limited pasturage has prevented the Indians from developing a stock culture. Only the very high mountainsides, too high for farming, and the ravines, too steep for planting, are given to grazing. A few Indians keep cows, and others a few pigs which they sell in the market. Some have a few sheep, two or three, or a small flock, but the sparse pasturage makes substantial herds impossible, and wool for the textile crafts must be purchased from large haciendas which have a tremendous number of acres in pasture.

European livestock has not appreciably increased the meat diet of the Indians. Only chickens are widely enough distributed to figure in the daily diet. These hardy creatures fend for themselves, lay occasional eggs, and blend readily with corn and beans in the family soup pot. The only traditional meat animal which the Indians domesticated was the guinea pig. A dozen or more of these pretty, furry little animals scurry about squeaking in the dark kitchen corner of every Indian home. Their meat is something like rabbit, rich and sweet. They are roasted whole over the coals, or boiled. Guinea pigs also play an important part in Indian magic and healing ceremonies.

The Otavalo Indians have thus absorbed the European techniques that could be adapted to their pattern, but have held firmly to the ancient economy of subsistence agriculture. Nearly everything grown is consumed by the family itself, and farm produce as a source of cash does not yet figure in the Indian economy. An Indian's health and substance is in ratio to his acreage. New land is for him an added unit of energy. The Indian rises from the earth itself. Year after year he spreads new roots like a mighty tree.

Maldonado and his family have finished their breakfast. "Ho, we'd better get homeward," cries Miguel. "Tomorrow is market day, and I still have cloth on the loom."

"Yes, and I have clothes to wash in the lake," adds María, giving the oxen a dig in the ribs.

The procession of the early morning repeats itself, the plodding oxen, Miguel Maldonado carrying the plow, the rest of the family following with hoes and mattocks, Rosita trotting along behind, her little feet moving swiftly to keep up. The rocky trail winds down and down to the shores of the lake. From the deserted field the figures descend. Smaller and smaller they become, till oxen and all are lost in the rocky terrain of the mountain.

From this great height the Maldonados' home community looks like a neatly drawn map. Tiny squares that are houses, twisting lines that are trails, black lines that are hedges and copses of eucalyptus trees. Beyond the pattern of the community is the cool green line of lake shore, then the deep blue expanse of Lake San Pablo. Its waters lie like an immense jewel amid the Andes with a setting of patchworked fields, roads, and Indian settlements.

THE COWS GRAZE ON WATER CRESS and lavender-flowering hyacinths as they wade belly deep on the shores of Lake San Pablo. A stray may be hard to find among the bullrushes.

Home to the Loom

The sun is high in the heavens. Already around the skirts of the mountains fringes of clouds are gathering. By afternoon the peaks will be lost in mist and cold winds will sweep down from the mountains. The Indians will draw their ponchos closer. The villagers will watch the threatening sky and close their doors against the blowing dust. Perhaps it may rain a bit, but scarcely enough to clear the air. For it is in the dry season, in August, that Maldonado plants his highest fields. Only high on the mountains is there enough moisture for plants to germinate and grow. The wheat fields are golden in the morning sun. Here a family is harvesting, cutting the full heads off with a sickle, leaving the straw long, as browse for the family stock. Only the peas on the middle slopes are green. They grow quickly, counting on the morning dew and the occasional showers of July and August. In another month they too will be dry.

SPINNING A WOOL THREAD AS SHE GOES, an old woman leads her small flock up the rocky path to the meadows. The wool goes into the home-woven fabrics which are bringing in the money that enables the Otavalos to buy more land.

August, September, and October are the slack months. The valley fields lie fallow. The dry corn stalks are gathered up and piled in great cylindrical mounds called parvas, to serve as fuel for the cooking fire and fodder for the oxen. This is the season when men with little or no high mountain fields often go away to work, or when the craftsmen spend longer hours at their looms.

In November the big rains come. This is the month for preparing the valley fields again and planting corn and beans and squash. The fields are plowed three times, soaking up the rains between. Then they are planted and in the succeeding months are cultivated several times, till the plants are strong and tall. In April comes the first of the green corn, *choclo*, and from then until the corn is dry the succulent ears are never missing from the Indian hearth. The green corn may be ground and made into cakes which are folded up in corn shucks and boiled. And a succotash is made of green corn kernels and green *haba* beans boiled together. As the corn gets drier and tougher it is softened in lye like hominy.

In June and July come the corn harvest. The whole family works together. Each one carries over his shoulder a sack improvised by tying together the four corners of a great square of strong cotton homespun. In this he gathers the ears and carries them back to the house where they are piled in a heap in the dooryard. Then the corn is shucked and the bulk of the harvest stored on a platform under the rafters in the interior of the house. Any relatives or friends who have helped in the harvest receive a basket of corn as their share.

Work goes on ceaselessly in the Indian home. Rhythmically, wack, wack, wack, goes Miguel Maldonado's loom. A fine blue-gray herringbone tweed is wound up on the loom. A gentleman's suit in Quito, a senator's overcoat in Bogoá, or it may, as much of this cloth does, find its way into the hands of tourists who carry them home to faraway lands, where a Parisian designer or a Fifth Avenue tailor may fashion them into the latest mode. Back and forth fly the shuttles. Meanwhile Pedro is busily spinning up a new warp on their elongated spinning wheel, ten feet in length. And young Manuel plies the carding combs, smoothing out the wool fibers for spinning, while the mother and little Rosita laboriously pick out the burrs and pull out the tangles of a mass of freshly washed wool.

You Eat When Hungry

Unhurriedly, but without stopping, the family moves from task to task, washing wool, carding, spinning, dyeing, weaving, threshing grain and beans, washing clothes at the lake, embroidering a blouse. And always there is food to prepare. The Indians eat when they are hungry, maybe

(Continued on page 121)

Vigo, a new red wheat, is setting records where soft winter wheat is grown.

VIGO WHEAT

BY H. R. LATHROPE

VIGO WHEAT was released by Purdue University in 1946—14 years after the plant breeders had made the cross that produced the first kernels of this new variety. During these 14 years the breeders who created Vigo were testing it in every way known to science. They found that the new wheat was resistant to leaf rust, was practically immune to the inroads of loose smut, and had straw stiff enough to be planted on the most fertile lands without lodging.

Partly due to its ability to use heavy fertilization and partly because of its innate ability to produce, the yields from this new wheat were found to be far beyond the highest hopes of the men who made the cross. The scientists who produced this high yielding soft red winter wheat are Dr. R. M. Caldwell, head of the Department of Botany and Plant Pathology at Purdue, and Dr. L. E. Compton, Associate Agronomist, Department of Cereal Crops and Diseases in Indiana of the U.S.D.A.

For nearly a century, soft red winter wheat producers had been growing wheat which was susceptible to leaf rust, stem rust, and which was weak strawed and sometimes susceptible to winter killing. One of the beliefs of the time was that leaf rust did little, if any, damage to the actual wheat yield, but after hundreds of tests in the field laboratories at Purdue, Caldwell and Compton found that leaf rust cuts yield at least five per cent in normal years. In years of severe epidemics, when the leaves of the plant are powdered with rust spores at flowering time, they found that producers were being robbed of at least 25 to 30 per cent on a 20-bushel per acre yield.

In Indiana the average yield of wheat in 1930 was 20 bushels per acre while deep in that part of the state known as the Pocket Area in southwestern Indiana, the yield was 14½ bushels to the acre. The yields were low because of rust and smut, and because the farmers, for fear of lodging, couldn't grow the wheat of that time on their most fertile soil.

These were the problems which Caldwell and Compton, the plant breeders, were trying to solve with a new breed of wheat. They, like the breeders before them, were tackling the painstaking job

THE HIGHEST MEASURED YIELD of wheat ever recorded in Indiana, 57½ bushels to the acre, is harvested by Harold Pirtle. Because Vigo has a stiff straw that will permit heavy fertilization without lodging, Pirtle used 400 pounds of 3-12-12.

that only rarely pays off with a new, successful variety. Like other plant breeders before them, Caldwell and Compton were involved in the game of trying to combine the good qualities of two varieties and produce a more nearly perfect plant.

Breeding Wheat

Breeding wheat is a long and tedious task. Each of the wheat flowers that produces a single grain of wheat is enclosed by its own chaffy leaflets called glumes, that must be spread apart before the plant breeder can even get to the flower. In order to make a cross between two varieties the breeder must open the glumes and pluck out the delicate stamens, the male parts of the plant, a week or two before the pollen ripens. In this way there is no danger of the flower pollinating itself in the normal fashion. When the pollen has ripened, the flower is again carefully opened and pollen from the selected variety is dusted in. For each grain of each new variety of wheat, this double invasion must be made.

The kernels resulting from the cross must be planted and nurtured for a year to produce the seed with which to start the testing program. Year after year, marked rows of the variety are grown to observe its resistance to loose smut, the many different races of leaf rust, stem rust, winter hardiness, height of straw, maturity dates, kernel size, test weight, milling qualities, and yield per acre. Milling tests alone involve growing several pounds of seed from pure lines for a preliminary test. Even after 2,000 bushels have been produced for milling tests on a large mill, the wheat may prove to be unsatisfactory.

New wheats also have to be grown in the mosaic infected nursery plots at least one year to test their resistance to this disease. Plant breeders can't predict all of the characteristics of the progeny of any given cross. They may have to try many hundred times before they are able to achieve their goal. Bringing forth a half dozen new strains of wheat may occupy a lifetime of tireless effort. There are many more obstacles in the production of a wheat for human food than there are in the production of corn, soybeans, or other crops which are for the most part fed to livestock. Even when the new wheat is ready for release, plant breeders are never quite sure how it will respond to varying climatic conditions in different parts of the area in which it is to be grown—factors of rainfall, temperature, moisture conditions, and soil fertility all seriously affect the production of wheat.

THE MEN WHO BRED VIGO, R. M. Caldwell and L. E. Compton, work in their test plots checking the hundreds of crosses they are making to find a still better wheat.

The Parents of Vigo

Among the collection of different strains of wheat at Purdue, Caldwell and Compton were interested in two in particular, Fultz (C.I. 11512) and Trumbull. Fultz is a strain that came into existence back in 1856 when Abraham Fultz, a Lancaster, Pennsylvania, farmer, found three heads of smooth wheat in his field of bearded Mediterranean wheat. The plant breeders found a selection of Fultz wheat which possessed a high degree of resistance to many of the 55 races of leaf rust which were known and catalogued in 1932, but which was susceptible to loose smut. The other variety, Trumbull, is a selection of Fultz made in 1919 by C. G. Williams of the Ohio Experiment Station. Trumbull is very much like its parent in appearance, but has a high degree of resistance to loose smut; is noted for its winter hardiness and stiff straw, but is highly susceptible to most all of the known races of leaf rust.

Purdue's canny plant breeders hoped that a cross between these two wheats would produce a new variety with the superior characteristics of each, resistant to leaf rust as is Fultz and to loose smut like its other parent, Trumbull. In 1932 the cross was made and the following year the first seeds of the new strain were planted. At this time the new wheat was known only as C.I. 12220.

During the time Vigo was known by a number, it was just one of about 300 strains that were being tested. Year after year as Caldwell and Compton made their rounds of the many check rows noting the

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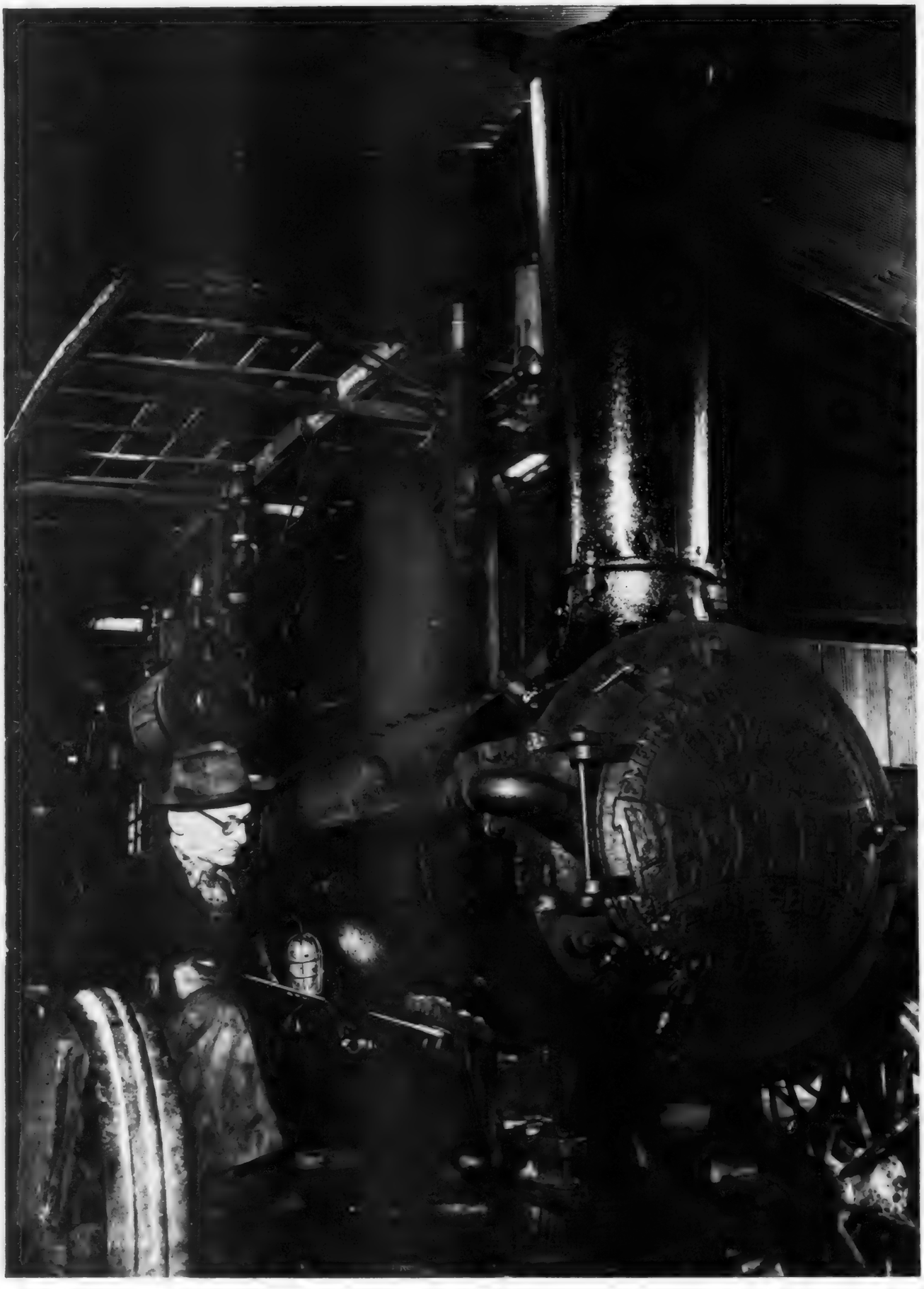
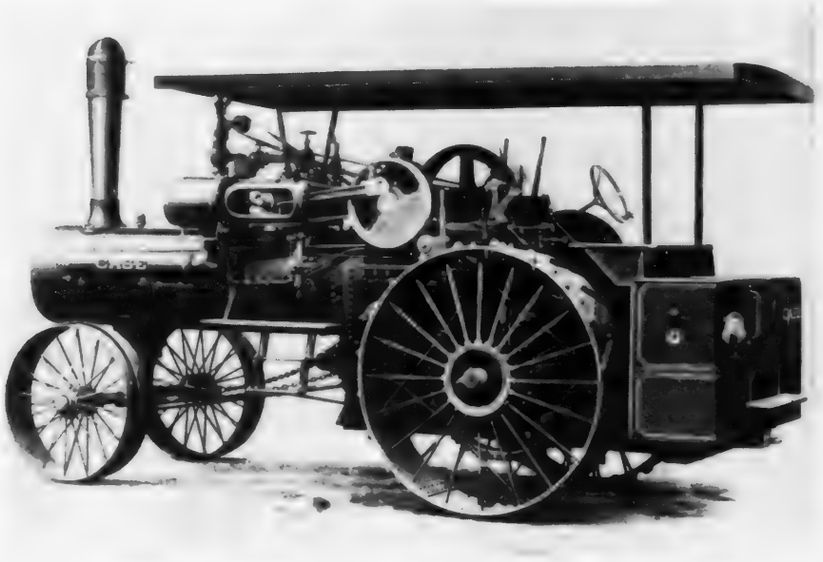


A STABLEMATE of Nellie's, an old PEERLESS, is being overhauled by one of Young's mechanics. This may be a labor of love, but the old engine may have a future as the power for a sawmill or as an emergency power plant.



THIS WAS NELLIE in her youth and glory as she rolled off the J. I. Case line in 1920. The fancy gadget on the stack is a spark eliminator.

GOODBYE NELLIE

BY ARTHUR J. BURKS

A traction engine, known as "Nellie" throughout New Castle County, Delaware, was bought by a Newark farmer, Frank Palmer, from the J. I. Case Threshing Machine Company in 1920. He paid $3,500 for the engine, about twice what he would have paid for it prior to World War I; and he named it "Nellie" for his wife. He always referred to the engine as "she" and folks around the county regarded the engine and Palmer as a team. "Frank and Nellie will be here bright and early in the morning to thresh out the lower twenty," they'd say.

Palmer operated a threshing rig during the season and in winter and spring when farm work was slack he hooked Nellie up to a sawmill. During the ten years that Palmer owned Nellie she caused him little trouble other than minor adjustments. Once she almost went through a rickety bridge and she slid off the road a number of times. Palmer had to get out of the way of a burning wheat rick one fall, ruining a valuable drive belt, which he hadn't time to uncouple.

DURING HER CAREER Nellie was set down on almost every farm in New Castle County.

Nellie was rated at 25 HP, drawbar, or 70-80 HP off the belt. Palmer took good care of her until he decided to retire. She was practically "as good as new" when he sold her to an Italian who was also a farmer and operated a sawmill.

The Italian owned her for a few years and then decided to go to gasoline. He sold the old iron horse to Arthur S. Young, of Kinzers, Pennsylvania, in the early 1930's. She was still sound of wind and limb and with a few repairs had years of usefulness ahead. Young paid the Italian $700 for Nellie, a top price at the time, when steam traction engines were said to be on their way out.

Art Young runs a snug harbor for old retired engines. He couldn't say himself whether engines are his hobby or his business. Nellie was berthed at the end of a long line of wrecks and semi-wrecks in Young's junkyard to await what fate had in store for her. His mechanics tightened up her joints, repacked her cylinder, replaced worn parts, and put her in top running order.

And there Nellie stood for seventeen years. From time to time she was fired up and given a turn around the yard to keep her tubes from rusting and to limber up her bearings. But as gasoline and electricity slowly took over all the former

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IT'S FAIR TIME

BY JOSEPHINE W. JOHNSON

Once a year the fair grounds come to life, farm families dress up, and haul in their fanciest stock and produce. The midway becomes a bedlam of color and clamor.

YOU can hear the County Fair long before you see it. The loud, mournful music of the merry-go-round carries itself over the autumn fields for half a mile, and then the bellow of the show-ring loud speaker comes to your ears, only a cheerful roar of words until you come in sight of the monstrous ferris wheel, the rainbow pennants, the smell of warm peanuts, and feel the dust of the midway under your feet.

Even if two decades or more have passed since your first big fair, there is the same atmosphere that never changes compounded of sheep wool, horse flesh, lowing cattle, the girls from the school band in satin skirts, pop corn, blue-eyed farmers in dark suits, and the rolling of the ferris wheel against the sky. Sam D. Jones, who is chairman of the Brown County Fair Board, said that when he was a boy the two big events of the year were Christmas and the county fair. "I've attended every fair we've had but one in my life, 79 times in all. Next year we'll celebrate our centennial with the fairs and then I'm going to retire from the Board." Jones has been on the fair board for thirty-seven years and remembers the old fairs when the cattle and horses were tied to trees instead of in barns and the big event was the mule race.

The fair is one of man's oldest rural forms of communication, entertainment, commerce, and in a sense, the summing up of his year. From July to October through the counties and the states there is a gathering together of the farmer's industry, his products, his daily life—all the carefully culled best of it—to make a living, colorful pageant for three short crowded days.

The Brown County Fair is one of thousands that are taking place each year during fair season and is much like the others. If there were oranges and cotton instead of apples and soybeans, it could be a southern fair; replace the corn with barley and it might be a northern Michigan fair.

In the first exhibit building inside the gate is the booth of the Franklin Grange, in which the Bible is displayed on a little stand and the text is open at Chapter Eight of the Book of Proverbs:

Riches and honor are with me, yea, durable riches and righteousness. My fruit is better than gold, yea than fine gold, and my revenue than fine silver.

And all around the Bible the Grange displays the durable riches, the fruit better than gold. Outsize, ruby-colored mangoes, green striped, marble kershaws, scrubbed

purple-white turnips, great crook-necked squash, big crisp apples, and glittering gold ears of corn. A life-like lamb, made of coconut cake with mild, black raisin eyes, sits before endless rows of jars: tomatoes, lima beans, peas, berries, pears, chicken, beef, rabbit, conserves, piccalilli pickles, marmalades and jellies that look prettier than jewels. Whatsoever the Lord had made edible the ladies have made palatable and preserved it where moth and rust and mold corrupt not.

The fair has something for every one: it is an exhausting supply of sights and sounds and scents. You need not own a registered herd of white-faced cattle or have your heart and finances bound up in a flock of Merino sheep to enjoy the County Fair. You may own no more than a cage of hamsters or a pot of fine begonias, but the sight of a great, grey Percheron thundering around the ring is still one of the most magnificent sights in all the world.

The first day of the Fair is less crowded, the exhibits a little fresher, and the 4-H members are there to compete with their calves and yearlings and keep calm poker faces, for the most part, when the ribbons are passed around. "This is a nice little heifer here," the judge says. He moves about quickly, juggling his double role of judging and teaching the 4-H contestants how to judge. "She has good quarters, very nice quarters, but she's lacking in the udder. Yes, we'd like to change this udder quite a lot." All along the ringside fence the boys and girls wait patiently, sometimes embarrassed by the stubborn mooing of their calves. "He judges by height," a boy whispers. "He said she has a 'nice' height . . ."

"Ah, he says that about all of them. That don't mean nothing."

There is a curly white bull and another shorthorn with brindle purplish-red waves, carefully patterned from the endless currying that goes on between showings—patterns erased and recurried in rough and silky hides. And behind them stood a little Brown Swiss bull, compact and satiny with a grey moleskin sheen

CHILDREN think the fair is wonderful, but parents soon have aching feet.

THIS HEREFORD STEER was tenderly cared for from birth to fair time. His owner, the 4-H club girl on the right, aimed at a ribbon, and her family helped prepare the entry.

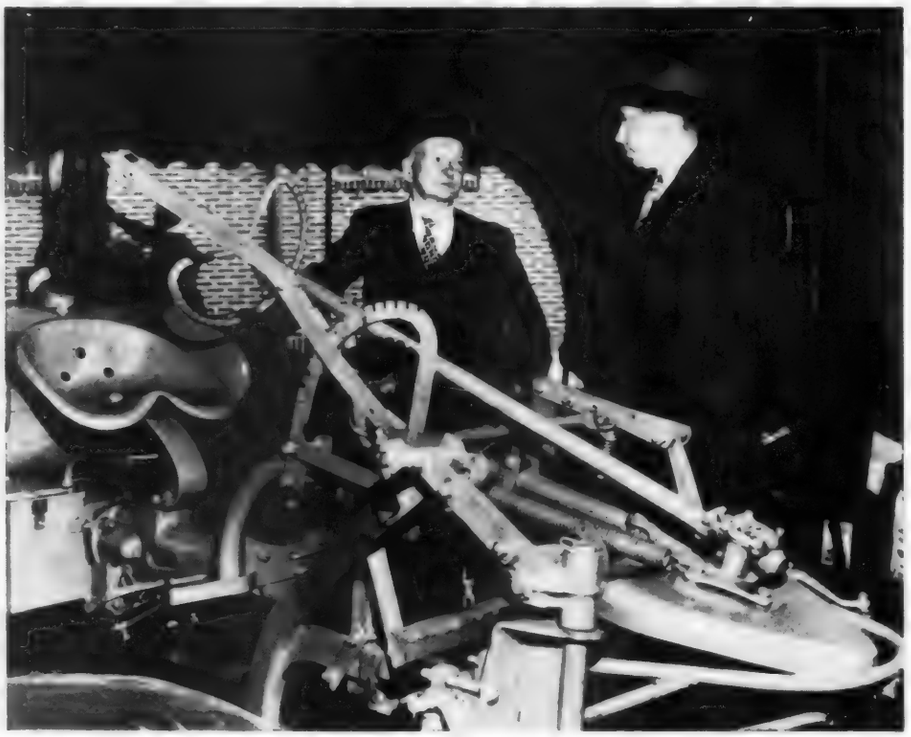
and gazing with calm expressionless eyes.

The mildness and tractability of the cattle at a fair is moderately amazing, confronted as they are with strange new faces, poking fingers, jerking ropes, unknown sheds, and the passing back and forth of their own lumbering kind. In all the cattle sheds only two small Hereford bulls tethered near each other keep up a morose, impatient bellowing and paw the straw. The black Angus, bred to beef until they waddle, lie row after row in complete calmness, like a warehouse full of big black blimps, blown up and weighted down.

In a sense these domestic animals are a creation of man as well as his possession. He has made the Angus into this meaty monster, just as he once created the blimp to fly in. The Jersey he has pared down into a milk machine, and the other stock he tampers with here and there, in-breeds, out-breeds, feeds, protects, achieves the proper balance for milk, for meat, for endurance of one kind or another, and the barns are packed with Guernseys, Holsteins, Herefords, Brown Swiss—all the sleek, patient, cud-chewing, end-results of this ingenuity and labor.

GETTING READY for the fair takes all year. Those rows of polished, neatly labeled jars were born in a hot kitchen and hidden from the neighbor's eyes until fair time.

SALESMEN at the machinery exhibits tell the window-shopping farmer the good points of their wares. The prospective customer is wary; maybe no machine is that good.



From the cattle barns the run-way leads to the long pig sheds and pens full of slumbering mountains of pork. Through the bars a short, hairy tail protrudes into the next pen. The bored snout of a Hampshire chews on the tail, and after a long time, sensation from the tail travels up through acres of flesh, tickles the minute brain of the owner, who grunts with sleepy rage, but does not move. "This one ain't big," says a little boy to his friends, "Le'me show you a *really* big one!" They duck from pen to pen, measuring one hairy ton after another. Their champion is a Berkshire boar so big he has his own special pen.

From time to time dissatisfactions stir in their porcine heads and there is always a fight going on, a guttural squealing fatty roar, but there isn't much space to do damage. The Berkshires with faces like pushed in bull dogs have jaws so upshot you wonder how they eat anything on the ground. In the ring they trot around in confused belligerence, kept apart by sweating men with canes and little hurdles while the judges hastily apply their standards of shape and size, of broad back and heart girth, plump cheeks and low flanks and point out a champion among the running hogs.

There is reasonable doubt as to whether the domestic pig is really an animal or not. To the owner he is a commodity translated into pure gold, to the consumer a mound of fat pork chops, sizzling bacon, pink hams and fragrant roasts, to the child he is a hippopotamus, and to the vegetarian a ton of hairy horror encompassing a soul.

The air in the swine shed is thicker than any place else. Not the sour disagreeable smell of garbage usually associated with pigs, which is, after all, a people smell, but a thick warm smell you can almost feel, rising from the steamy hides of Poland Chinas, pink eyed Chester Whites, and rough red Durocs. "Which is his head and which is his tail?" says a little boy and dashes on to find something with more style. Over in one section is a pen of tall red pigs, advertised as The Lean Swine, and lean they appear compared to their porky kind. They have long foxy snouts and large ears and bright, unintelligent eyes. Their hair is reddish with gold lights and they can get up and move about without staggering. These are the Tamworth pigs and they and the Hamprace represent a trend away from the chuffy, all-fat pig once the champion of all fairs.

The sheep pens are next, with one end full of the nervous, wide eyed goats,

THE GAME OF CHANCE is a constant challenge to fair visitors. They part with their dimes, but win or lose, they go away feeling that Barnum was right.

long eared Nubians with black oriental faces (whom little boys love to insult by calling hound dogs) and sharp horned little Alpines, one of which butts a surprised child into the straw. The Cotswold sheep are stolid and self contained, being almost invisible behind the long grey curls that dangle over their eyes and down their noses. Their backs are broad and flat and the wool so deep they seem about buried in it. Some are protected with blankets and even head caps with holes for their blank gentle eyes to peer out. Some wool is whiter than others, but contrary to poesy few sheep have fleece like driven snow. The long fraternal relationship of man and sheep goes back for centuries in mutual dependence, but the non-commital expression on the sheep's face is about the same as it was in the dawn of history. They stare and chew and lie quietly with their grey woolly hips bumping against each other. One thinks of Walt Whitman's praise. "I think I could turn and live with animals. They are so placid and self contained. They do not sweat and whine about their condition. They do not lie awake in the dark and weep for their sins . . ."

Beyond the sheep pens are the tents with merchant's goods and between the tents and the main show ring the crowd pours slowly and continuously, drawn back and forth by the loud speaker's announcements of prizes awarded and events to come. The bright loud cheerful band music makes you forget your aching feet and helps the losers bear their disappointments, and there is a holiday, carnival air, although the faces of the crowd have a calm expectant look, not a jovial or carefree one. They are all well and conscientiously dressed, never overalled or straw hatted, not even when caring for live stock in the barns.

And little boys wearing weird red caps they won and loaded down with handbills and pamphlets on refrigerators, milking machines, hot water tanks, tractors—all the free literature they never read, but discard slowly throughout the day to fall and flutter like white chickens in the wind and mud. Apparently equipped with extra arms they also swish their quarter whips and whirl their birds on a string and point, climb, and eat in one simultaneous motion.

In the big ring exhibits flow in and out all day. And between the cattle judging and the Belgian tandem judging and the show horse, "pleasure class" riders, the announcer blares out about the evening show, "The show that cost a million dollars to produce, The Broadway Scandals of 49, a-two-hour-fast-moving-musical-comedy-review-with-a-gigantic-cast . . ."

Through the years the concession booths haven't changed much. You throw darts at balloons or rings at pegs or wait

THE RACE TRACK FENCE is the child's grandstand for the afternoon races. These youngsters are like sparrows; they stay perched until they think of something to eat.

for the rattling, nail studded wheel to stop, and the prize you don't get is the same plaster doll covered with tinsel and pink chicken feathers that you didn't win twenty years ago. The same dour dark man sells oriental "scenes" painted on black velvet with the moon a fish-belly blue; and there are the same merry-go-rounds with their hurdygurdy music and children with rapt faces; or children in delighted terror riding the whirling aeroplanes in imminent danger of being hurled out of the earths orbit—there being a special joy in straining gravity to its utmost; and the same sad-eyed little ponies, a dime a ride around a dime-sized ring. Madame Ziva is usually there, with her fly-specked diagram of the brain in sections, to see all and know all and call you by name, but the "London to Paris" show is not a perennial. ("There was a fellow here a couple of years ago," Sam Jones said, "who was running a downright raw show without our knowing it. When we found out about it I took a couple of the other Board members and went to him and told him if he didn't clear out right now we would come back and pull the show right out from under him. Why, he had two ladies there that were absolutely stripped naked. Oh, it was raw alright!")

There are the gadget men though, dependable as the merry-go-rounds and the coconut pies. One with a gadget for peeling and cutting potatoes is flushed and fiercely friendly. "Every real American likes french-fried potatoes!" he bellows. "Now why do these American men only eat their french-fries in restaurants? Well, I'm gonna tell you. It's because when they get'm at home they get one that's thick and one that's thin and one that's burned and one that's not cooked at all. Now with this handy little cutter they're all uniform; you simply slice the potatoes this way, and then you turn it and slice it this way, and follow through

YESTERDAY he rode on his father's tractor. Today, he drives a new one all his own—until mom and a 'kerchief spoil his illusion.

FRIENDS from across the county may not meet from one fair to the next, and catching up on news fills much of the day.

FARMERS say they don't grow corn for the county fair, but neither should a good crop go unnoticed. These friends have compared entries in the same spot for 50 years.

to the blade with your thumb. Now when I started this little talk folks, I said that I was going to give you this cutter for a dollar and that I was going to give you another dollar absolutely free—and that's just what I'm gonna do! The biggest department store in town would charge you two dollars for this little cutter, one dollar is their profit and one dollar is what it costs us to manufacture this wonderful little device. Now what I'm gonna do is to sell it to you for just one dollar, just what it costs us to manufacture it, and let you keep the dollar the store takes for profit . . . and you'll have french-fried potatoes, the All-American dish, right in your home . . ."

There are many more All-American dishes already baked and decorated and set out in endless rows—all looking so highly edible, so mouthwatering and delicious that there should be a bushel of blue ribbons scattered all over the place from twelve inch caramel layer cakes down to the smallest baking powder biscuit. You stroll drooling by spice cakes and sponge cakes and white cakes and angel cakes and devil cakes and coconut cakes and cherry pies, peach pies, berry pies, lemon pies, pumpkin pies, raisin pies, donuts, corn sticks, coffee cakes, muffins, rolls, and bread, and cookies. And you haven't yet seen the jars of jelly and the fruit and the vegetables and honey and the sorghum and the candy and the prize apples, the prize squash, the onions, sunflowers, turnips, cauliflowers. On the other side, to distract you, are the needle work booths with potholders thick as autumn leaves and crocheted doilies and millions of fluttering aprons and the 4-H girls clubs have set up little booths and made scenes symbolizing their motto of heart, head, health, and hand. The Decatur Duty Doers have a little railroad set up called Lifes Railroad, and the Flying Needle girls have dresses and pot holders and more aprons.

If you are not yet exhausted and in need of a pink sugarspun cone or a fried square donut from the concessions, you re-route yourself through an acre of white crockery plates and cups—Anything Here For A Quarter—and come to the farm machinery. Each year this exhibit grows in space and importance at all the fairs, although as yet the main show is made up of the animals. So far no tractor can produce bacon and no chops are planted by seeders, but the number and variety of farm implements is enormous and the Fair's periphery is ringed with red and green tractors, manure spreaders, seed drills, corn planters, side delivery rakes, discs, harrows, steel corn cribs, and milking machines with a life size mechanical cow to demonstrate and a stand of pint size milk buckets for souvenirs.

The last day of all fairs ends with the grand parade of blue ribboned cattle, impatient horses, enormous floats decorated in crepe paper, and triumphant, brassy music reaches its climax at noon and from there on down the day there is a sort of hasty and scrambling disintegration. There is an impatient loading of trucks, knocking down of booths, a hunting up of strayed children and a swirling of dust under departing wheels. Until finally the last protesting pig is carted off, the last bantam cock is gone. The fair grounds look thoroughly spent and used and a piece of pink crepe paper off the 4-H float flutters a few feet and expires in the dust.

Something for everybody—and there is even an Old Timer's Building where folk who have driven in from a hundred miles away can visit and meet their friends. The man who thought it up lives in Chicago now, but he comes back every year to visit and be at the fair. And to Sam Jones, the man who has been to 79 fairs, this home coming where everybody can get together and see each other again is the most important part of all.

THE POTTERY HAWKER has low overhead. He's in business as soon as he unloads his wares. The customer takes her choice. There is one price; anything goes for a quarter.

FOR MANY, the climax of the fair comes when a dare-devil risks his life to amuse them. Whether he rides a motorcycle through fire, is thrown from a bucking horse, or only crashes an old car into another old car, the grandstand is generally packed. The master of ceremonies may be the county commissioner.

DESERT SWEETS

BY DICK BUNNELL

Date production is complicated by eccentric ripening habits, sex, and weather, but the industry is booming in the Southwest.

BILL TAYLOR'S interest in dates stems from a spell with the British Army in Egypt. Now he owns one ot the largest groves in Arizona and not only markets fresh dates, but makes fruit cake, pudding, date bread and other goodies and does a flourishing mail order business. Taylor's grove is near Tucson.

The date was once an expensive and rare imported delicacy to be enjoyed only on special occasions like Christmas. Now we can buy them reasonably enough at any grocery store at any time because we are raising most of our own.

A small beginning in growing the date palm in this country on a commercial scale was made about the turn of the century. Now there are about 4,000 acres in California and 600 in Arizona and a good start has been made in supplying our domestic wants. California is out ahead at present but Arizona desert soil is particularly friendly to the date palm and new plantings are going in every season.

The date palm is familiar to everyone who has seen a travel poster. It looks like an oversized feather duster, growing up to 80 feet in height. The present crop of fronds is carried at the top and the scars of previous crowns cover the stem from the root to the top. The fronds may be as long as 20 feet.

The date palm has sex. The male palm's only function is to fertilize the female and he himself bears no fruit. In the Arizona groves there is usually one bull to 20 cow palms. California bull trees are apparently more potent that Arizona males, for the ratio in the former sometimes goes as high as 50 to one. The date palm is one of a relatively few fruit bearing plants which is not self-pollinating. Most trees which are not self-pollinating bear a crop of fruit without the help of human hand but the date palm is different; it must be pollinated by hand for best results. Bees, insects, and the wind can do only a very incomplete job of spreading the pollen.

The males are the first to blossom. As soon as the flower pods crack open the blossoms are removed from the tree, placed in open boxes, and stored in a dry room for 24 to 48 hours. The pollen falls clear of the blossoms and is then ready to use in dusting the female blossoms.

Taylor explains that the females are, like all females, unpredictable. They must be inspected often, for once the blossoms open they must be pollinated within 48 hours.

The pods are cut away from around the flowers, which are dusted with pollen by means of a cotton swab. In case some of the blossoms are not ready to be fertilized, a small strand of the male blossoms is tenderly tied within the cluster of female blossoms. Palm by palm, cluster by cluster, this delicate handwork must be done to insure a top-grade fruit in quantity. Each individual cluster will weigh, when ripe, about 20 pounds and contains 1000 pieces of fruit.

The Harvest

By mid-July the dates will have reached almost full size, but not until a month later will they begin to ripen. Just as soon as this happens each individual cluster of fruit is tied up in a waterproof bag. This protects the dates from the inroads of hungry birds, mice and other varmints and also keeps off the showers of the rainy season. Once the ripening fruit is wet it sours and becomes unmarketable.

In Arizona the harvest begins during the last weeks of August. The fruit does not ripen all at once, but gradually, date by date, and each tree must be gone over many times. An over-ripe date is just as

(Continued on page 88)

THE MALE BLOSSOM is cut from the stem when the pods open and the pollen is ripe.

A SPRIG of the male blossom is inserted in the female flower and tied in place.

THE MALE POLLEN is also dried, collected, and dusted from bags on the female flower.

THE TALE OF A CALF

Grass feeding western calves is taking the gamble out of beef making. The grass brings a bigger profit than corn.

BY C. M. LONG

SOME people have said, "A farmer who goes in for fattening cattle doesn't have a business; he has a disease." Others add that feeding heavy cattle is one of the few forms of gambling that is legal in every state. Of course, the shrewd operator makes some money most years, and in years like 1938 and 1947 he may make more than a radio comedian. But then there are years like 1933 and 1936 which will break the best of them.

For the not-so-shrewd operator, it doesn't take disaster years to go broke changing high priced corn into low priced beef. One fact that has been proved by the winners and losers in this game is that to make money, or even to break even, in the heavy cattle feeding business, the feeder must sell at a higher rate per pound than he bought.

In order to take some of the gamble out of cattle feeding a large group of Midwest farmers is using a less risky system of feeding on grass farms. This system makes each acre of grassland more profitable than an acre of corn when cattle are bought and sold at the same price per pound. With this method they can survive a drop of almost half the price per pound between buying and selling without losing their shirt and pants.

This is the tale of Spotty the calf, and of the program that has been developed to take the gamble out of feeding him and his brothers to produce good beef.

Spotty was born on April 12. On the same day dozens of other calves were born in the big Montana herd. Hundreds of other calves, born a day or two earlier, were testing their awkward legs or were standing with their heads poked beneath their mothers' flanks. These calves had the Hereford's white face, red coat, and beef making conformation. There have been so many generations of pure blood infusions into the herd that it would take a genetecist rather than a cattle judge to point out the original longhorn or scrub ancestry. Spotty and his brothers were excellent grade calves—the kind that are needed if this grass feeding program is to be successful, whether they are Shorthorn, Angus, or Hereford.

THE HARDY CALVES winter well with only open sheds for protection. They glean the corn fields and are roughed through to pasture time on good legume hay alone.

◀ HITCH-HIKING A RIDE up the mountain is the easiest way for Spotty to travel to the summer pastures. When he returns in the fall he will weigh four hundred pounds.

There were still patches of snow on the ground when Spotty was born, but the first grass was beginning to grow. The herd was kept on winter feed for a week longer and then they followed the snow line up the mountain slope to the summer pasture. During the summer the calves followed their mothers as the herd foraged the mountain slopes, converting grass into flesh. The calves suckled their mothers, learned to eat grass, and added 250 to 350 pounds to the 75 pounds which was their original birth weight. Early snow on

the high peaks started the herd down toward the lower slopes where the ranch hands met them and completed the roundup.

Around the middle of October when Spotty was six months old and weighed 385 pounds, a buyer from the cornbelt looked over the herd and bought Spotty and several hundred other calves. A few days later they were herded to a railroad siding and loaded into a cattle car knee deep with straw. Their ride east was interrupted twice while they were unloaded for feed, water and rest. On October 22, the morning of the third day of travel, the cars arrived in Lafayette, Indiana, where Spotty and 50 of his brothers were unloaded from the railroad cars into trucks and driven a few miles into the country to the farm of Marion Roberts, their new owner. Here the youngsters were put into a quiet feedlot with hay, grain, and water and left alone. For five days they were undisturbed except for the daily feeding and a visit from the vet to check their temperatures. Roberts knew that they had had a hard trip and needed nothing so much as quiet, food, and rest to throw off any ill effects of travel and avoid the danger of shipping fever. Up to this point, Roberts had carried out the first two steps in the program; he had secured excellent young stock and had shipped them east without a loss.

Roughing Them Through

On October 27, when Spotty and his brothers had recovered their land legs and were rested from the train ride, they were turned into the fields to pasture on rye. Later some of them were put in the corn fields to glean after the harvest. When the snow and ice came they were put out in the pasture and fed good legume hay from the stack. Up to this time a few of the smaller calves, those weighing under 325 pounds, had been given a pound of corn and a pound of oats daily; Spotty and the other heavier calves had never seen such rich feed.

During the winter the calves lived in the open and were fed legume hay with no grain or other supplement. The rugged vitality of the animals, which is bred into them, and their heavy coats, which they also inherit, make it possible for them to get through the winter on this diet and gain from one half pound to a pound and a half a day. Roberts and other feeders figure that three-quarters of a pound is just about right and try to regulate the feed to hit this average.

In April following they were turned on rye pasture and left there for a month. A month later Spotty and the other year-old steers were put on super-pasture. On this super pasture of mixed legumes the steers averaged two and a half pounds a day gain in weight. When they came off winter rations and were put onto pasture they were thin, scrawny beasts that Roberts wasn't particularly anxious to have his friends see. If they had looked much better, however, he would have known that he was not following the program, but was feeding too much. By August they had put on over 200 pounds, which made them look like different animals.

At this time, around the first of August, Roberts hauled the self feeders out into the pasture and began serving a full feed of crushed corn and cob to put on finish. Two and a half to three months of pasture and crushed corn put the steers in shape for selling. Spotty and the others left the farm October 25, a week after the new calves from Montana came in. Feeders try to market their steers by the first week in November, at the latest, since the market for cattle finished as these are to "good" or "low good" begins to break at about this time.

Gains Made

The gains made by Spotty and the other calves are typical of all calves raised on the grass system. From October to April or May, when they are put on pasture, they average three-fourths of a pound a day gain, which is considered ideal for this system. When they go onto spring pasture the calves that were underweight in the beginning and were fed a little corn may have a bit of fat on them, but the others will be rail-thin. This is what the feeder aims for, since putting fat on them in the winter cuts into profit and accomplishes nothing. It has been found that a heavier calf which has been fed well through the winter will weigh no more by August first,

after three months of super pasture, than will a calf which went onto the same pasture quite thin. In other words, the extra feed required to put on the weight in the winter is wasted.

The gains of these thin calves for a 100-day period from the last of April until the first of August have been over two pounds a day, and frequently have been as much as two and one-half pounds. If

FAT GRASS-FED CALVES REACH MIDSUMMER after gaining 210 pounds from April 27 to August 3 on pasture alone. Feeders may sell at this point or feed a few bushels of corn to put on some finish.

THIN HAY-FED CALVES END THE WINTER looking lean to downright scrawny. They have gained three-quarters of a pound a day on hay alone and are hungry for pasture.

the daily gain is less than two pounds there is something wrong with the pasture.

During the 90-day grain feeding period from August through October the gains will never be as great as they were on the early pasture. Perhaps this is because the summer grass is not as digestible as the early pasture. At any rate, the gain on crushed corn and cob and pasture is but a pound and a half a day.

During the entire feeding period salt and minerals are fed free choice. The mineral mixture consists of 10 pounds of pulverized limestone, 10 pounds of steamed bone meal, and 1 pound of common salt. Regular salt or the new mineralized salt is also kept before the animals. During the heat of the summer salt consumption will sometimes reach a quarter of a pound a day per head.

To sum up: during the fall and winter feeding period, 150 days, they gain about 125 pounds; during the straight grazing period, 90 to 120 days, they gain at least 200 pounds; during the fattening period on crushed corn and cob and grazing, 100 days, they gain 150 pounds. This gives a gain of approximately 500 pounds while the animals are on the farm.

The Cost of the Grain

A few dozen Indiana farmers, including Marion Roberts, Alfred Henderson, and others, have kept careful records of their cattle feeding program in order to find the most profitable way to raise calves with this new method. The cost of putting a pound of beef onto the calves is taken from their records for 1944-1945. Much better returns were made on following years, but this particular year was chosen because farm economists think that prices and profits will eventually settle to the level that existed during this period.

Four of these farms handled a total of 327 calves on a straight grass feeding program; a fifth farm fed 30 calves the old-fashioned corn way. The average weight of the four lots at the beginning of the feeding year, October 16, 1944, was 347 pounds. The average weight of the corn fed lot was 360 pounds. All of the calves came from the Flying Arrow Ranch in Montana and each lot was a gate cut. All of them cost $13.50 per hundred pounds. The calves were bought for them by a Midwestern cattle agent who picked a western herd that could supply them with good stock and made all of the shipping arrangements.

All five lots of calves were roughed through the winter on hay. In April the corn fed lot was put in dry lot and given a full feed of grain until October 15, when they were sold. They were sold weighing 934 pounds, a gain of 574 pounds for the year. In figuring the cost of feeding and handling the animals it was found that it amounted to 17½ cents a pound for the meat that was added. The four grass fed lots were sold on October 31, 1945, at an average weight of 877 pounds, a gain of 530 pounds while they were on the farm. The cost per pound of added grass fed meat was slightly less than nine cents.

The profit above feed cost, but not counting pasture or labor, was $58.47 per head on the grass fed animals and $19.95 for the corn fed steers. In figuring the above costs corn was listed at $1.12 and oats at $.72 per bushel, hay at $20.00 and straw at $10.00 per ton. These were the farm prices at the time. Every cost that could be thought of, except the cost of pasture and labor, was included, such as: interest on the money invested in the calves, interest for a ten month period on the corn they ate, taxes (including Indiana's Gross Income Tax), insurance for a year against death from any cause, veterinary expense, mineral, etc.

The reason for the greater profit on the grass fed lots was that these animals ate but 17.95 bushels of corn per head during the year while the lot-fed bunch of 30 ate 54 bushels per head.

One of the four farmers that grass fed his steers in this experiment was Alfred Henderson, of New Richmond, Indiana, who says, "You can't make money feeding cattle. It's what you *don't* feed them that makes you a profit. I used to feed heavy cattle and changed to this new system rather reluctantly. The first year I fed light calves I also fed heavies as a hedge. The light animals were just throwouts from the stockyards; very poor stuff to compare with the good grade heavies I

was feeding that year. At the end of the year I found that I had made my corn price on the heavy cattle and that I had made a nice profit on the scrubby, grass fed steers. Since then I have given up feeding heavy cattle and have bought the best western calves that I could get."

An Acre of Beef

All of the feed that went into the calves to add 530 pounds to the weight of each was raised on the farm. The figures kept by the five Indiana feeders reveal the amount of land it took to raise this feed and the amount of beef that an acre of land produced. The feed that it took the grass way included one ton of mixed legume hay or its equivalent in silage for winter feed. The smallness of this amount is due to the fact that there was plenty of fall grass that provided some food until around December 15. The hay or silage that it took to winter a calf was raised on one-quarter acre. Pasture from May to the end of October amounted to half acre per animal. A quarter of an acre of corn supplied the 17 to 20 bushels needed to finish the steer.

Thus, roughly, one acre of land is required to produce 500 pounds of beef. In the cost and profit figures that were worked out for 1944-45, the cost of hay and corn were charged against the beef at the current rate for these crops which left $58.47 to cover the cost of labor and pasture. A very generous labor bill of $1.00 a month was charged against each calf, which left a handsome profit of $92.94 for an acre of pasture land; a profit so good that corn with its heavy labor requirements looks like a sucker crop for someone farming for fun and not for profit.

Super Pasture

Super-pasture is not a fictitious vegetable growth from the planet Krypton; it is the name given the heavily fertilized grass and legume mixtures of the Midwest. A super-pasture must be brought into production before a farmer can even think of trying grass fattening. It is composed of grasses like timothy, brome, and fescue, combined with such legumes as alfalfa, ladino clover, and birdsfoot trefoil in the right combinations to meet the land use. Furthermore, to get the necessary growth, the land must be fertilized in the amounts and with the combinations of phosphorus and potassium to meet the requirements of heavy production. Almost any farmer with reasonably flat land can have this kind of pasture if he is willing to make the investment of lime, fertilizer, seed and effort. If he is dependent on ordinary pasture he had better steer clear of the grass fattening method described here, for it won't work.

"It's a little difficult to say just what it takes to make a super-pasture," says Alfred Henderson, "because we have been changing our requirements from year to year. Basically, the land is seeded to alfalfa, ladino, timothy, and brome. The pasture fits in for two years between oats and corn on the four year rotation. When we started we fertilized at the rate of 200 pounds of 0-12-12 on the oats; later we stepped that up to 300 pounds of 0-20-20 on the oats and a 100 pounds on the corn; now we fertilize at the rate of 600 pounds of 0-20-20 to the rotation.

"The cost of seeding the pasture, at today's prices, comes to $6.60 per acre for the 12 pounds of seed that we use. I realize that this is a heavy, expensive seeding but a lighter seeding might not get

THIS PAMPERED DARLING, Judge Roy Bean, Grand Champion at the International, brought $11.50 a pound. Feeding corn to heavy cattle is like playing the slot machine—occasionally you hit the jack pot, but you're likely to lose in the long run.

LABOR SAVING STRUCTURES, such as this cheap slat form for holding and feeding chopped hay, keep the labor requirements for grass feeding cattle to a minimum.

a stand of grass and that would be a lot more expensive. The cost of fertilizer for the four year rotation is $16.50 an acre or $4.12 a year. This is not such a stiff price when you begin to see the increase in yield after the start of this system, and there will be as big an increase during the second and third rotations, as the soil is improved. As an example, when I took this farm over, a 30 acre field that was rather isolated was checked and made 34 bushels of corn per acre. Seven years later, after two rotations of grass, the same field made 130 bushels. The first year was not too favorable for corn and the second was favorable, but weather won't make that kind of increase.

"Our production of legumes," Henderson continued, "makes it necessary to check the soil for acidity every year and to lime much more often than we used to. This fertilizer program is paying off in grass. The pounds that you put on a steer with yellow corn are the pounds that cost you money. Any time that I can sell my steers in August at the same price per pound that I paid for them, I'll do it and take my profit on the grass. I feel that even the 90 days of corn feeding will cost more than it's worth unless there is a rise in the per pound price of the animals."

Hazards of the Grass Method

Few if any business enterprises are entirely free from hazards. The grass feeding program does take much of the gamble out of cattle feeding, but there are still two important danger periods. The first is shipping fever at the time the calves are shipped from the west; the second is bloat when the animals are put onto the early summer pasture.

Shipping Fever

Loss from shipping fever is kept to a minimum by proper handling. Over a period of eight years the corn belt feeders have brought in several thousand cattle with a loss of less than one per cent. Individuals have, of course, had considerably heavier loss than this, but they have usually been beginners at this game.

Two practices are believed to be respon-

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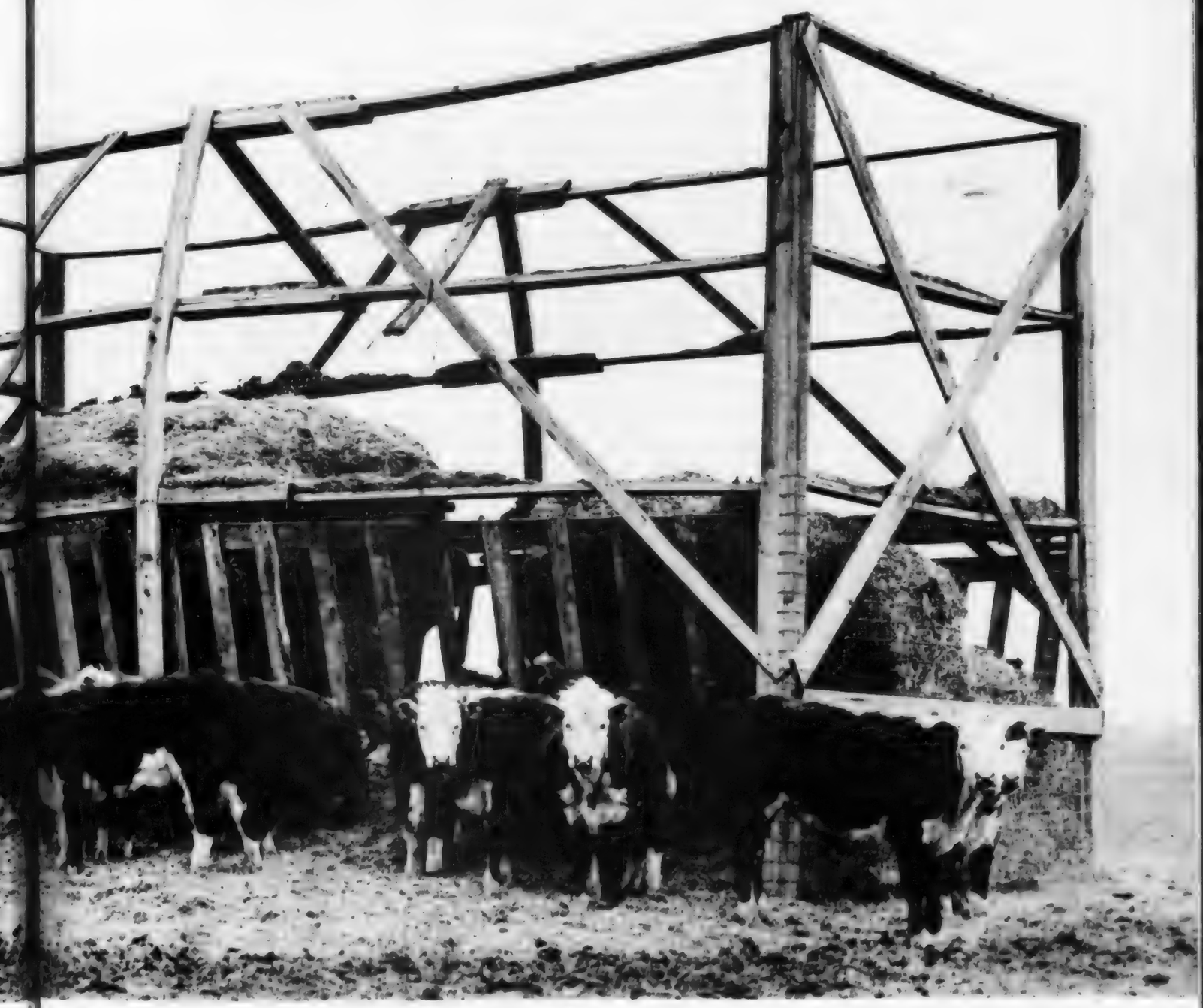

Reed Canary Grass...Wet Land Forage

BY M. E. HEATH AND W. WEISS

For a specialized job of gully and run-off control reed canarygrass can't be equalled. And it's one of the few grasses which will produce forage on bogs, swamps, and seepage areas.

DO you own a swamp: have you a bog on your farm? Have you a stubborn gulley that grows bigger every year or a ditch bank that wanders around over your fields? Reed canarygrass may be the answer to your problem. Plant reed canarygrass in the swamp and the bog and reap hay and pasture; sod the gulley and ditch bank with this grass and anchor them permanently against further damage. For a specialized job of making a wet field pay its way as a meadow or pasture and for binding gullies and slopes against erosion, reed canarygrass has no peer.

Reed canarygrass is a native to both America and Europe. Its range is the northern half of the United States and Southern Canada. It was spoken of as a forage plant in Sweden in 1749 and foreign varieties were brought here as early as 100 years ago. It is now found chiefly in Oregon, Washington, Michigan, Minnesota, Wisconsin, Iowa, and California, but is gaining popularity in other parts of the Corn Belt on over-flow and poorly drained lands and for gulley control.

Reed canarygrass is a hardy, leafy, cool-season, coarse perennial which grows in dense clumps and spreads underground by short creeping rootstocks. It makes an erect growth of four to six feet with leafy stems usually stout enough to prevent lodging. Clumps often are three feet across. The leaves are broad, smooth and usually light green in color.

The seeds are oblong, blackish-brown or gray in color, smooth and free from chaff. Well matured clean seed weighs 44 to 48 pounds per bushel. The seed shatters very rapidly, especially if the weather is dry and warm at ripening time.

Reed canarygrass is a wet land grass, although it will stand more drought than many of the common cool-season grasses. It will grow and thrive where water covers

WET WEATHER BOGS such as this, a dead loss otherwise, can produce a crop of grass and hay if planted to reed canarygrass. Under proper management a wet field will pay its way in milk and meat.

the soil surface through much of the growing season. On peat bogs and seemingly bottomless quagmires, where animals bog down or dare not venture, reed canarygrass has built a firm, strong sod over which horses, tractors, and wagons pass with safety. In the drought years of 1934 and 1936 it was the only grass that remained green through the entire season at the Iowa Experiment Station.

The grass does best where the climate is moist and cool, but the plant is sensitive neither to hot nor cold. It makes its best growth on fertile, moist, swampy soils. but it makes a very good growth on high well drained productive soil if there is enough moisture and available nitrogen for spring and early summer growth.

Reed Canarygrass for Pastures

The best use for reed canarygrass is for pasture on land which is too wet for other grasses. Its long life, long growing period and the large quantity of forage produced are its strong points. Along the Pacific Coast on reasonably well drained land and with good stands, reed canarygrass will furnish pasture nine months each year. On higher, drier lands, the pasture period is not so long. In the Midwest where longer winters occur, the pasture season usually extends from shortly after the last heavy freeze in the spring until the early heavy freezes in the fall.

Reed canarygrass pasture is best when it is young. Stock do not like it when it gets old and rank. The best management is to rotate pastures, keeping the stock on the new growth. If possible, it should be clipped immediately after the stock are moved off. This promotes uniform growth of the grass. It will not stand close continuous grazing, another argument in favor of rotational grazing.

Understocked pastures often result in the plants getting too growthy and somewhat harsh and tough. When the pasture is properly stocked so the animals can graze the new growth, it is a palatable grass. It is by far superior to the weedy and native vegetation found growing on the millions of fertile but poorly drained and overflow acres throughout the northern half of the United States.

It has given excellent results when grown with Ladino clover on those soils where this legume is adapted. On poorly drained soils or overflow land where mud and silt are not deposited, you may expect this combination to succeed well. It is important, however, that the grass not be allowed to get higher than 15 inches. If the livestock are unable to graze it down, it should be clipped so that the Ladino clover is not smothered. Ladino clover can be introduced in old stands of reed canarygrass by seeding about two pounds per acre in the early spring. By the end of the second year the mixture will be about 50-50. This balance can be maintained with proper grazing and fertilization. Some farmers like an alsike—reed canarygrass mixture on bottom land soils.

Hay

Until recently reed canarygrass was considered of little value as a hay crop because stock shunned it. However, if put up at the proper time it is palatable and has good nutritional values. The best quality hay is made from thick stands that have been pastured early in the spring to set back the haying period. This produces more leafy growth.

The best hay is produced by mowing when the first heads begin to appear. At this stage the hay will contain from 10 to 12 per cent protein.

Reed canarygrass responds well to barnyard manure and fertilizer. The recommended treatment consists of about 150 pounds of 50 per cent potash, 100 pounds of 20 per cent super-phosphate and 60 to 120 pounds of ammonium nitrate to each acre, or a complete fertilizer with equivalent plant nutrients applied in April on old stands. Barnyard manure may be applied at the rate of 10 to 15 tons per acre.

Grass Silage

Reed canarygrass is just starting to find favor as silage. As silage it makes a cheap

REED CANARYGRASS spreads by trailing roots as well as by reseeding. Clumps planted 18 inches apart soon converge.

THE USUAL METHOD of planting small areas such as gullies is to dig in sods by hand. Start at the head of the wash and plant down the slope as time allows. Creeping rootstocks and reseeding will form an all-over cover the second year.

succulent feed and it is one way to make a wet meadow pay its way. By making it into silage it is often possible to save the grass when you find it difficult or impossible to cure it as hay. This is a common practice in the Coos Bay section of Oregon where it is fed to dairy and beef herds with good results. This same practice is reaching into the Corn Belt and the Northeast as more and more farmers become accustomed to ensiling grass. Some farmers use a preservative, others do not. It has about half the feed value of corn silage, considering the feeding value of the silage and the cost of the preservative.

The young, tender grass makes the best silage, is more palatable and has higher feed values. Frank Rossler, a Dunn County, Wisconsin, dairyman, ensiles reed canarygrass and uses no preservative. He has had top results from feeding 20 lbs. of canarygrass in the morning and 20 lbs. of corn silage at night. Rossler wilts the grass and picks it up with a field chopper.

What kudzu has done for the South as a gulley and erosion control, reed canarygrass can do for the North. Like kudzu, reed canarygrass has a double barreled usefulness in that it can be grazed while it heals and plugs up gullies and waterways.

The usual method of establishing a stand of canarygrass in a gulley is to transfer sods from a "sod bank" to the gulley. A sod bank, once established, can be used year after year. One pound of seed will sow one tenth of an acre, (an area 45 feet by 100 feet) enough of a bank to take care of the gullies on the average farm.

Pick out a good fertile site for the sod bank. Sow the seed on a well prepared and firmed seed bed any time in the spring or late summer and cover lightly. A year later the sods will be ready for transplanting.

Good seed, of course, should be used. If the seeding is done in the summer or early fall, seed harvested during the same season is recommended.

When transplanting sods, mow the top growth short and use a spade or plow to obtain sods. The spreading roots are in the top two inches of the sod; nothing is gained by going deeper than this. If alternate strips of sod are left on the bank, the grass will spread across the scalped or plowed areas in one season, replenishing the sod bank.

Small amounts can be dug with a spade; if larger amounts are needed an ordinary shallow plowing is best. After the sod is plowed it can be cut up by discing. A tractor scoop is sometimes used for loading.

In many areas where grassed waterways are particularly difficult to establish by seeding, proper use of reed canarygrass sods will provide adequate protection. After shaping the waterway and preparing a seedbed, the sods can be applied to the center 10 or 15 feet with a manure spreader at the rate of 15 to 20 tons per acre. The sods should be disced into the soil. Following this, a waterway seed mixture of other grasses is seeded over the entire waterway area and rolled to cover and firm. The sodded area furnishes more and quicker protection as compared to only seeded waterways.

In gullies where machinery cannot be operated, it will be necessary to plant sods by hand. The sods when planted should be two or three inches below the ground

REED CANARYGRASS holds this wet weather runoff firm and tight against erosion. Problem—to keep from spreading.

WRONG TIME to cut reed canarygrass for hay. At this stage it is coarse and protein is low. Animals find it unpalatable.

RIGHT TIME to cut for hay or silage. The heads are just appearing and the protein content will run to twelve per cent.

surface to prevent being washed out. If the gulley bottom is soft or muddy, the sods can be stepped in with your heel to the desired depth. If the soil is dry, the use of a spade will be necessary. Established grassed waterways that are beginning to regulley can be brought under control by planting reed canarygrass sods about 18 inches apart in the gulley or rill bottom.

If conditions are favorable, there is another and easier way of establishing the grass in a gulley or waterway. Well-jointed green hay is cut and spread at once to a depth of one half to one inch and then covered with two inches of moist soil. New plants will develop at the joints. A flow of water before the plants have rooted will void all the work so it is important to be on good terms with the weather man before trying this method. The green hay also may be tramped into the soft gulley bottom.

Still another method of planting is to use the hay and seed heads. This is effective only in the spring and best stands are obtained if planting is done about mid-June at ripening time. The hay mulch aids in holding the seed in place. Since June is normally a wet month in the Midwest, this method is not practical where heavy rains wash out the planting.

Ernest Harms, living three miles west of Underwood in West Pottawattamie County, Iowa, is now using reed canarygrass sods from his second one-tenth acre sod bank. His first sod bank furnished sods for himself and his neighbors for two years. He has used various methods of transplanting. He planted hundreds of living dams on rainy days using only a spade. He cut the sods into chunks about the size of a fist and planted them in newly formed over-falls of waterways and in V-shaped ditches cutting up through old or new grassed waterways. It should not be used in drainage ditches with low

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THE MATURE PLANT will reach six feet and clumps will spread to three feet. (2) Enlarged head showing seed development. (3) Seed with covering. (4) The seed itself.

THE RIGHTFUL HEIR TO THE FARM is the son who stays at home to help with the working of the land. The labor and management he has contributed have increased the value of the place; often he has used his own savings to improve the land and buildings or for new equipment. He has invested his life in the farm; his right to it should be protected.

The Rightful Heir

BY RUSSELL L. BERRY

A father may transfer the farm to his son in many ways. Unhappiness and legal tangles occur when the transfer is improperly made.

GEORGE ROBERTS, a retired grain farmer of South Dakota, watched as his son, Jim, swung the combine around and backed the awkward machine slowly into the shed. Jim grinned through the dust that clung to his face and powdered his eyebrows; the job was done and the harvest was certainly worth grinning about. This year Roberts planned to spend part of his share of the wheat money for a trip to California he had always wanted. He knew that Jim would put a big part of his share into improving the farm. There would be no more worrying about the mortgage for he and Jim had paid off the last of it two years after they formed their partnership, soon after the war.

"That mortgage was two years older than you are," the father told Jim as they left the bank after the final payment, "and I hope that it is the last one you'll ever have to see."

Roberts saw in the transfer of the farm the completion of a cycle of life. It was shortly after the first great war that he had taken over this farm and, now, he hoped that Jim would step in. He hoped, as most fathers do, that Jim's life would be easier than his had been. He had bought the farm when land was high and had lived under the shadow of debt and a mortgage for more than twenty years. He hoped that Jim wouldn't start with the same burden, but he had other children and he must be fair with them too. He hoped that he could accumulate enough money so that when he died he could leave the farm to Jim and leave the other children their share in cash. If he died before then, Jim would have to pay off the others in cash to be able to keep the farm. But it was hardly fair to expect Jim to pay present prices for the farm when farm incomes were falling. And it was hardly fair to divide the farm value, share and share alike, when Jim, by his work, had contributed so much to their having the farm free from debt. And it was certainly unfair to expect Jim to pay the other children for the improvements which he himself had made and paid for already. Roberts was certain that equal inheritance was not always fair inheritance; he'd have to see his lawyer and get the whole thing thrashed out. He had told Jim that the farm was going to be his and Jim had gone on making expensive improvements on the place on this guarantee. He'd really have to see his lawyer next week.

Procrastination, they say, is the thief of time — and time is the very fabric of life. Roberts used up his alloted time and died months later without leaving a will or any other written arangement that would protect his son. In such cases there is but one solution to the problem of distributing the estate; the courts decide the division on the basis of the law. The court held that Jim, his brother, and his two sisters should have equal shares in the farm. Since the farm had been paying well for the past few years, the other heirs decided not to sell their interest in it. They wanted Jim to lease the farm on a crop share basis and he agreed to try .Families being what they are, Jim soon realized that four landlords, all relatives, were too many and decided that he would rent another farm where he could work out a more impersonal, businesslike arrangement with the owner. The home farm was rented to a stranger.

Young Jim Roberts may yet be able to buy back the farm, but when he does he will be paying his brother and sisters for the assessed value of improvements he made on the place himself at his own expense. In the meantime the place will be rented to strangers who will not care for it as he would. Should the income from the farm diminish, either because of inefficiency on the part of the renter or falling agricultural prices, the other heirs may be willing to agree to a sale based on a fair evaluation of the worth of the property. On the other hand, any one of the heirs may decide that the farm should be sold for the high dollar. In that case Jim will have to buy the farm under a heavy mortgage, or see it go out of the family.

Primogeniture and Democracy

The farmer who fails, like Roberts, to make a will is agreeing in effect that the general laws of inheritance shall be substituted for his own best judgment. In the old days these rules decreed that the oldest male child should inherit all of the estate, but

THE FARM IS SOLD by court order to settle the estate of a man who left no will. Too often a son must buy from the other heirs improvements he made himself.

with the establishment of our democracy we abolished primogeniture, and adopted equal inheritance for all direct heirs. This method of inheritance served us well during the period when it was easy for some of the heirs to take their inheritance in cash and move west, where there was land for the asking, or move to the growing cities and so avoid splitting up the family-sized farm. It does not work so well today, when the farm may be physically divided into smaller and smaller units, for it takes but a generation or two to cut the farm into such small plots that none of the heirs can make a living by farming.

In order to keep the farm of sufficient size to be economically practical, the practice has developed of passing it on to one child and arranging for cash payments to the others. In cases where more than one child wants to go on farming, the parents often use their savings and credit to help one of them secure land, while willing the home farm intact to the other. Excellent though this practice is a recent study showed that only 16 per cent of the farm owners had made wills of any kind.

The protection of the widow is another aspect of this problem. Rarely is she capable of managing the farm herself, yet it is impossible to expect the son to farm well if he must seek his mother's permission for the carrying out of every major plan. Since most farmers have their savings tied up in the farm itself it becomes a problem how to transfer the farm to the son and still liquidate enough of the savings to permit the wife to live independently without feeling beholden to her children.

George Roberts knew the problems and had even thought of the solution in his own case. He made the mistake of not putting them on paper in proper form and signing them. It did not matter how often he had said that he intended to leave the farm to Jim; without a will the courts had no other choice than to divide all property equally.

THERE ARE MORE WIDOWS THAN WIDOWERS, for women outlive their husbands by six years. A man can make arrangements that provide an income for his widow and, at the same time, permit his son to start farming on his own before his mother's death.

Looking back over the situation, young Roberts cannot help but feel disillusioned over the promises made by his father. He feels doubly bitter at the fact that the very improvements he made should now be part of the financial burden he must assume if he buys the farm back.

Another South Dakota family, whose situation was similar to that of the Roberts, handled the situation differently. The father, Ralph Bland, discussed the whole situation with his son and two daughters so that they would know what he planned to do and be able to state their opinions on the subject while he was alive and his heart full of both love and wisdom. He then went to his attorney and prepared a will containing the following clause:

> I give, devise and bequeath unto my son, Ralph Jr., my farm, consisting of the northeast quarter of section eight and the northeast quarter of section seventeen in Sully County, South Dakota, provived that he pay his sister Jane, $8,500.00 and his sister Ann, $8,500.00.

If George Roberts had made such a conditional will it would have insured a satisfactory transfer to his farmer son when he died. The fact that such a will could have been revoked at any time before his death would have given the elder Roberts ample control of his property in case a change of plans was necessary. Such a will would have given Jim the security that he needed to improve the farm and it would have prevented the present unhappy family situation.

Examples of such conditional wills have been found in other states. A Michigan farmer had his lawyer prepare a similar will which read:

> I hereby give and devise unto my son Joseph my farms in Huron County, Michigan, the same to be his and his assigns forever, except however, that under the express condition and obligation that he pay my daughter Elizabeth $24,000 and that he pay to the widow of my deceased son $12,000 and the children of my deceased son $12,000. It is my will that said sums of money above specified and all thereof be paid by said son Joseph within one year of the date of my death and without interest, and the said real estate is hereby charged with such obligations and payments. Should, however, my said son not pay said sums of money, then in that event said land shall become a part of my estate and I hereby devise the same as follows: one-third to my son, one-third to my daughter and one-third to the widow and daughters of my deceased son, share and share alike, the same to be theirs, and their heirs and assigns forever.

Freedom to dispose of one's property by

A WILL IS MADE, with the help of a lawyer, which will protect the son. This does not conflict with the father's plan to retire and transfer the farm to his son at that time.

will being very broad. George Roberts could have made a conditional will such as his South Dakota neighbor, Bland, made no matter what state he lived in. Since state laws vary, however, it is important that a lawyer be consulted when such a will is made. His job will be to translate the desires of the farmer into exact legal language so that it will hold up and to see that the document is properly signed and witnessed.

Wills Should be Flexible

While Roberts could have made a will like those discussed above, he could have made some improvements. A weakness of the wills already cited is that they required the sons to make fixed dollar payments to the other heirs regardless of the change in farm incomes and land prices. Such wills may become unfair. For example such a will made during depression and coming into effect now would not be fair to the other children now that farm incomes and land prices are higher. Likewise wills made today requiring a fixed payment at some future time may be quite unfair because of the falling farm incomes and land prices. To avoid this difficulty Roberts could have had his lawyer draw a will like this:

> I hereby give, devise and bequeath unto my son, Jim Roberts, the old home farm (described) provided and upon condition that he first pay to my wife, if she be living, the appraised value of said farm. In case my wife, Helen, does not survive me, I hereby give and devise said farm unto my son, Jim Roberts provided and upon condition that he first pay to my daughter, Rose, one-fifth share; to my daughter, Lois, one-fifth share; to my son Marshall, one-fifth share of the appraised value of the farm. Said appraisal to be made within one year of my death by three disinterested persons appointed by the probate judge.

Under such a will Jim would have received two-fifths as his share of the farm. This double share would have been justified because Jim and his wife had modernized the house and barn and made other improvements. They also had provided a home for the elder Roberts for three years. Finally, the other children had received gifts and schooling that Jim had not shared.

In the Michigan will already discussed the farmer had reduced the price of the farms because of the improvements that the son had made. A better way would be for the father to pay the son for the improvements made or give him an interest bearing note payable out of the estate for such improvements. Both these plans are simple and effective. They avoid embar-

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COW FEED FROM AIR

BY JONATHAN and PERRY GARST

The crux of cow feeding is to find enough protein to balance the carbohydrates. Proposed solutions include the use of grass silage, young pastures, and urea.

A few years ago American farmers were amazed by the news that cattle can be fattened on ground corn cobs. They were told that in a balanced ration four pounds of ground cobs put as much weight on steers as three pounds of corn. No wonder they were surprised at this, for corn cobs had never been considered a feed, let alone a fattening feed. If they had been any good, one would have thought the Indians or the colonists or some smart farmer would have discovered it before 1945.

Looking back, one finds plenty of evidence, which had been common knowledge for generations, that indicated cobs were possible cow feed. Looking ahead, one sees unthought of possibilities for new sources of cow feed. Just because cobs had never before been considered anything but a filler, their discovery as a fattening feed opened our eyes.

Corn cobs are low in two familiar feed carbohydrates, sugar and starch, but they are high in what we might call "coarse carbohydrates," that is, cellulose or "crude fiber" and similar plant materials. For convenience we are going to refer to these materials as "cellulose." Cellulose is the basic feed in corn cobs. It is also the main structural part of all plants. If cellulose is fattening feed, then you suddenly realize there is a lot of cattle feed in the world. The whole subject of cow feed can stand a review.

← **UREA, made from air, is unlimited. We are learning how to feed it to increase the output of the cow's protein factory.**

Cattle are the great forage consumers of the world. They graze the ranges and the pastures; they winter in the corn stalks or around straw piles; they eat the hay out of the barns and the silage out of the silos. It is the cow that makes human food out of forage and the roughage of the world. The cow is well designed to do this. She has the broad muzzle for gathering in lots of feed. She has rotating jaws and strong molars to grind it. She has a paunch or rumen to hold coarse feed while it softens and ferments, then she chews it again as a cud. She has plenty of capacity to digest bulky fodder. Moreover, she manufactures most of her vitamins except the "A," which comes from green grass, and a cow can store enough Vitamin A in her body to last several weeks. Nature has done a good job on the cow.

The Cow is Made for Short Grass

But we expect a lot more from a cow than nature intended so we have to improve on her abilities and make up for her deficiencies. A cow is really designed to graze short grass. She can harvest, chew, and digest that without any aid or improvement by man, but her muzzle is not designed to handle tall tough forage, which man can easily mow, chop and store. Her molars are fine for grass but machinery can do a better job grinding coarse hard feeds. However, it is in the chemical balance of all her feeds, except short grass, that the cow fares worst. On a dry basis, short grass contains 15 to 20 percent protein and 75 to 80 percent carbohydrates.

There is hardly a herbaceous plant on the face of the earth that doesn't contain at least 75 per cent carbohydrates. But a cow has to have about 15 per cent of her feed in proteins and there are few plants anywhere, except young grass and legumes, that contain so high a proportion. This is the crux of the problem of cow feed. With enough protein to balance the carbohydrates, we could raise cows enough to eat most of the nonwoody vegetation in the world and grow fat and give milk.

We all know that a cow will eat roughage. When we say "roughage" or "fodder", or "forage", we mean cellulose. When we mention corn stalks or straw, we are talk-

ing about very high cellulose feeds. No one expects a cow wintered on corn stalks and straw piles to get fat. In fact, this kind of wintering in the old days meant starving a cow to death slowly enough so the process would not be quite completed by the time of spring grass. When we say alfalfa hay we are talking about cellulose too, but alfalfa cellulose is balanced with 15 per cent protein. Good alfalfa is six parts carbohydrates to one part protein. That makes cow feed. The vegetation of the world is fully three-fourths carbohydrate, but it is about 20 parts carbohydrate to one part protein? It isn't cow feed.

The Cow's Need for Protein

Why does a cow need so much protein? Why does a plant have so little? A cow needs about the same proportions of protein as any animal. The active part of a living cell is protoplasm and the active part of protoplasm is protein. There is ceaseless breaking down and renewal of the protoplasm, and there is growth of new tissue. All this requires protein. The need for renewal and growth of protoplasm measures the minimum requirements for protein.

In addition to the vital processes involving protein, there are chemical reactions within the protoplasm which produce energy or store fat. These processes require fuel only. There are three possible sources of this fuel. If there is an excess of protein available, then protein will be burned purely for fuel. If not, fuel can be supplied by sugars from the digestion of carbohydrates, or from fats eaten, or from fats that have been built and stored within the body of the animal itself. These fuel foods are only transient within the cell, but the consumption of them is six times as great as in the consumption of protein for renewing the protoplasm. That is why a cow needs 1/7th protein and 6/7th's fuel nutrients in her feed.

The plant cell differs from the animal cell in its source of protein and energy. It can build protein from simple inorganic nitrogen compounds. Its ultimate source of energy is sunlight, with which it builds its own carbohydrates. But the active part of a living plant cell is also protoplasm—not greatly different from that of the animal cells. The reason a plant is low in protein is that there is proportionately little protoplasm in a plant. Most of the bulk and weight of a plant is inactive or even dead tissue. An animal has dead cells for skin and hair, and a considerable weight of inactive tissue in bones, but the first requirement for an animal is to be able to move and to gather food. The weight of inactive tissue is kept to a minimum.

The plant does not move to get its food. It spreads, both below and above ground. It also grows tall in competing for sunlight. Therefore, the first requirement for a plant is to build a structure, and it builds a structure of cellulose. The larger the plant, the greater will be the proportion of structural cellulose and the smaller the proportion of protein.

There would certainly be more feed in the world if there were less vegetation but a higher percentage of protein. This is true because the lower the protein content gets, the less return there is from the amount that is present. A cow balances her nutritional intake whether her feed has been balanced or not. If she is eating straw with three percent protein, then she can use only 18 percent, or six times as much cellulose. This means she can digest only 21 percent of the straw. A cow can eat about 25 pounds of straw a day. There isn't much net benefit in handling that through her alimentary tract when she can only digest five pounds of it. An animal needs both air and water to live, but if it gets so much water that it cannot get enough air, it drowns. If a cow gets so much cellulose that she cannot get her protein, she starves. The cowman's problem has been to avoid cellulose. He has not thought of it in those terms, but successes in feeding can be explained as a solution to that problem.

THE ROUGH FEEDS, hay, silage, cobs, straw, must be fed in balance with protein supplements. How to cut down on the expensive protein is the cow feeder's problem No. 1.

The Buffalo Knew

First there is the case of the wild cattle of America, the buffalo. The great herds were on the short grass plains just east of the Rockies. There were few on the tall grass land, the prairies farther east. The reason for this is that the short grass is relatively rich in protein. These plains are dry lands watered infrequently by short summer showers. They are lands of high winds. In fact, they are lands unfavorable to plant growth—no trees, no brush, no tall rank grasses survive. The short, quick-growing type of grass does best; short grass, that is, grass without much structure, grass high in proportion of protein. Moreover, because of the low rainfall the dry grass retains these values, which would quickly be washed out by rain. The plains do not yield much feed per acre, but it is good feed and it is good most of the year.

The green pastures of the more humid areas were generally not originally grass lands. Green pastures are best in a climate with a long growing season of cool, moist, weather. The natural vegetation for such a climate is forest. Once the forest is

THIS IS THE COUNTRY where the buffalo roamed. Land of sparse rains, the buffalo multiplied and grew fat on the tender, new grass that came up after the infrequent showers. Now it is producing some of our best feeder cattle.

cleared, these areas provide conditions favorable for the continuous growth of sod-forming grasses. However, forest soils are poor in minerals and in nitrogen. Farmers have added minerals and through the planting of clovers for nitrogen have multiplied the carrying capacity of such pastures. Recently in order to get more vigorous growth there has been a shift toward taller, ranker grasses with deeper roots. This required careful pasture management. The pastures are divided into small fields and the cattle are rotated in such a way as to keep the grass short but not too short. In other words, get all the vigor possible, but avoid cellulose. If the grass in managed pastures grows too tall, it is clipped back or cut for hay. You don't want cattle in "grass up to their bellies"—too much cellulose; too small a proportion of protein.

In areas like our corn belt, pasture grasses are not well adapted. These areas are characterized by deep soil, infrequent rain, and hot weather. Here are grown coarse, large, deep-rooted vigorous grasses. These plants as a whole are high in cellulose and low in proportion of protein, but they have been selected and used because of their peculiarity in concentrating their protein and minerals in an easily separated part of the plant. These areas produce grain. We can harvest the grain with its protein and throw the rest of the plant away.

Historically, grains were grown, not only because they concentrated the protein, but because their carbohydrate content is in the form of starch instead of cellulose. A man can digest starch, but cannot digest cellulose. Grain is human food. Only recently in the history of the world have grains been abundant enough to be used for cattle feed, and now practically only in North America. But even when we separate out the grain for cow feed, we do not have a high enough proportion of protein. Grains are one part protein to 9-12 parts fuel foods. You can fatten a steer on straight corn, but he will waste part of it.

Oil Cake is Going Higher

So what can be done now? One solution is to grow another kind of grain, one that stores oil instead of starch. Then you can squeeze out the oils and feed the protein-rich cake. This is very satisfactory, but the future supply of oil seed cake does not look promising. So far, this cake has been a by-product of oil production, or in the case of cotton, of fiber and oil production. Fibers are going synthetic, detergents are replacing soap, and synthetics are replacing oil in paints. The demand for oil is decreasing and with it the prospects for high protein by-product oil seed cake. Anyway, there never has been enough grain feeds, not to speak of the cellulose we throw away, or that we could harvest if we could use it.

Another method of providing high protein feed when cattle are not on rich protein pastures is to raise legumes for hay and cut them before they are full grown. At this stage they are very high in moisture and thus harder to cure. But by cutting them young, by avoiding the accumulation of structural cellulose, the proportion of protein is kept high. With less production in weight per acre, early-cut legumes produce more milk or meat per acre.

Urea Does It

But to return to the subject of feeding corn cobs, which are very high in cellulose. If there is too much cellulose, if the problem has been to avoid cellulose, why feed corn cobs? The answer is that there is

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WHEN A BOY AND HIS SISTER climb on the back of the old family horse and set off across the meadows they ride right out of this world into a land of fun and adventure. A horse that will ride double is a handy friend to have. He will take a boy and his sister to the stream where the fish are not afraid to swim right under the nose of a horse, to the hills where the choke berries grow, and to the woods where there's a stump high enough for a mounting step. Most any horse can give a youngster a ride, but one that will carry double is better.

THE SUMMER SUN

THE COUNTRY can be the best of all possible worlds in summer. When city parents are wondering if their budgets will stand the strain of sending their sons and daughters to camp, country kids walk out the back door into a world of sunshine, cool pools, grassy hillsides, and an association with the animals which man has turned to his use. He learns to do a man's work and knows the satisfaction of a job well done. And if he gets interested in raising a calf or a duck or a pig there'll be no trouble about keeping him out of poolrooms nor away from the juke box in the corner drug-store. Country kids—and parents too—are just lucky.

The Corn Protein Problem

Hybrid Seed doubled yields, but protein content slid. Now corn scientists are learning how to combine high yield and high protein content in the same ear.

NOT everybody in the Corn Belt is happy about hybrid corn. With the aid of hybrid seed, farmers have increased their production about 50 per cent; they're happy. Hybrid seed producers have seen their product take over nearly 100 per cent of the corn acreage in the important corn growing sections of the country; and they're happy. But the dry miller, who mixes and sells feed commercially, has watched the protein content of corn steadily decline for the past 15 years; he's not happy.

The farmer, too, is aware that the corn going through his corn picker and his hogs contains less protein than the open pollinated varieties he once grew. Prior to the development of the hybrids, the corn harvested across the Corn Belt contained about 9.5 per cent protein. Within the past 15 years the figure has dropped to 8.5. Livestock, however, still need as much protein as ever, and the owner has to dig down in his pocket to pay for protein supplements to make up the difference. To replace the missing one per cent of protein the farmer has to add three pounds of soybean oil meal, or its equivalent, to every 100 pounds of feed. This brings his feed costs up about 12 cents on the hundred, and leaves no doubt in his mind that this corn protein problem is a serious one.

In 1946 Dr. J. E. Hunter of Allied Mills pointed out that to compensate for this loss of one per cent of protein in the 1946 corn crop alone would require two and a quarter million tons of soybean oil meal. The soybean farmer is the only one who regarded this as good news.

The case of the missing protein has been under investigation for several years. The solution to the problem has not been conclusively found, and today hybrid seed companies and agricultural colleges are tackling the subject from every angle they can think of. They are attempting to learn the relationship between corn protein, soil fertility, and the rate of seeding. They want to know what the lower protein content means in animal nutrition and to find out they have set up feeding experiments. They are gradually coming up with the right answers for the thousands of farmers who are asking themselves if they should worry at all about this corn protein problem.

Two years ago Lowe Seed Company of Aroma Park, Illinois, pushed into the farm headlines with the announcement that they had perfected a high yielding hybrid with a protein content of between 14 and 16 per cent. The Corn Belt was interested because here was what farmers, millers, and feeders had been hoping for since before the days of hybrid corn. Hybrid corn breeders had previously concentrated on increasing quantity. This was the first major step in building up quality. This year Lowe's seed is plentiful enough to distribute to farmers throughout the area to which it is adapted, and other strains are being developed for other areas. Many farmers who have already tried this hybrid, however, have failed to get protein content much higher than 11 per cent. This may be due to lack of nitrogen in the soil.

When Oren Bolin, research director for Lowe's, fially developed his high protein hybrid he had completed ten years of experimentation on it. He had crossed high protein open pollinated corn, obtained from the University of Illinois, with selected inbred lines of good yellow corn. After four years of selection and breeding he had produced his high protein hybrid which still offered good yield, standability and disease resistance.

Before he went to Lowe's, Bolin had worked as a plant breeding specialist with the University of Illinois and it was there that he started research on his high protein hybrid. Bolin's work on corn protein was nothing new for the University of Illinois, which is now an important center of corn protein research. Dr. Cyril G. Hopkins started the corn protein research at the University of Illinois back in 1896 with the old open pollinated Burr White, which had a protein content 10.9 per cent.

Dr. Hopkins wanted to know if the protein content of corn could be altered by selection. He divided the ears harvested from his first test plots according to their protein contents. The following year he planted both the lowest and highest protein corn from the seed he had saved. This experiment continued for 50 generations until in 1949 descendants of the Burr White were the highest protein corn in the world, some of it containing 22 per cent. The grain which was selected for low protein contained only 5.1 per cent, and had an extremely small germ, since most of the protein is stored in the germ.

The practical side of this extended experiment comes when research men borrow the high protein qualities of this corn and combine them with high yield in good hybrids. This is what Bolin and other scientists are doing in the development of new strains. Planting the Illinois high protein corn directly as open pollinated seed is not practical for the farmers, since, in tests with U.S. 13, it has yielded only 47 bushels to the acre against 106 for the hybrid.

If the farmers of the Corn Belt were still planting open pollinated varieties of corn the protein question would probably never have come to the surface. "The first people to notice the difference," says Dr. R. W. Juggenheimer, of the Illinois Dept. of Agronomy, "were the dry millers. They are required to state on the label the total protein content and when the protein in corn went down it had to be replaced with soybean oil meal." This unhappy situation

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PROTEIN is the backbone of all stock feeds. If it isn't supplied by the corn the farmer must make up the difference with expensive supplements, usually soybean meal.

A HOG doesn't know percentages, but he can tell which corn is highest in protein content.

BY GRANT CANNON

BLIND FARMER

"The eye of the farmer fattenth the ox" says an old English proverb. There is a world of truth in this saying, for much of the farmer's success depends on the careful observation of his livestock and crops. He must cull his flock and look over his herd to see that his animals are healthy and producing; he must check his fields to see that the crops are harvested at the right time; and he must watch the growing crops for signs that show lack of proper fertility. He must look over his land to see that erosion is not gnawing away the slopes and he must look at the sky to make his best guess about the weather. In the evening he must read to keep up with this changing world of agriculture, and strain his eyes with the drudgery of bookkeeping if his records are to be kept in order.

But there are farmers, and good ones, who have been blind from birth, or have lost their sight for so long they but dimly remember the world of light and color and form. These men can do their own milking; are good enough judges of cattle to enter judging contests at the county fair and come off with honors: and cull their own poultry. They are accomplished in the small crafts of farming such as carpentry, electric wiring and repair, plumbing and metal work; are competent farm managers with all the record keeping that management involves: and can even plow a straight furrow when necessary.

One of these sightless farmers is Jack Caldwell, who runs a 115 acre dairy farm near Burlington, Kentucky. Caldwell lost his sight over twenty years ago when he was a boy. He and another 13 year old had poured a half pound of black powder into a toy cannon and failed to provide a long enough powder train. The resulting blast left him permanently blind. After high school and college he and his sister saved their money and, with

BARBARA AND HER FATHER, Fred Ward, make a game out of working the tractor together. During the war, however, when he could get no help on his New Hampshire farm, Ward was totally dependent on his five year old son, Lawrence, to steer the tractor when they worked in the fields.

LONG EXPERIENCE, and perhaps a sixth sense, tell Jack Caldwell when he is near his mail box. The platform on the post is for bulky braille books that the library sends.

their father bought the farm Jack now operates.

Standing on the porch of the house, watching Caldwell and his hired man work in the barn yard, it is impossible to tell which is the blind farmer and which the seeing helper. The tall, slim Caldwell works around his farm with complete assurance. There is little or no fumbling, and he scorns a cane or a dog helper. When he walks to the house he follows a definite path, where his feet know and recognize all of the guiding contours. At the end of the path he turns down the edge of the hard road, and when he comes to the lane that leads to the house he turns into it without hesitation.

Like most farmers who love their farms and are proud of them, Caldwell enjoys showing visitors around the place. He likes to take them up the road and into the field that he is converting from crop land into hay production. With no other guide than the feel of the road under his feet he turns and walks into the field.

"During four of the five years I've had

this farm this land has been used for row crops, as it was for a long time before," he said, "the first hired man I had was an excellent worker and very conscientious, but he refused to contour farm—felt there was something wicked about plowing a crooked furrow. When I began finding small gullies between the rows of corn and deltas of top soil at the end of each furrow, we came to the parting of the ways. Arthur, the man that helps me now, used to be with the Soil Conservation Service and he and I see eye to eye on conservation. One of the first things we did was to lay out the contour lines—he used the transit and I held the pole and drove stakes—and later we put the field into alfalfa. Down the slope here you can see how we are healing the gullies that were starting. You see that bare line running across the field," Caldwell said, pointing directly to the thin patch and following it across the field with his finger, "that is the old fence row. We took out the fence when we converted all of this land to forage crops, but we haven't got the alfalfa to grow so well there.

"Our land on this side of the road goes clear up beyond the stream to the sassafras trees," he continued, "At one time I intended to cut out the trees, but they are so beautiful, especially in the fall, that I decided to leave them there. That is one of the things I remember from the old days, driving along and seeing the sassafras trees in the fall."

BECAUSE HE DREADS reaching into a feed sack and finding a rat Elsaesser pampers his cats with quarters under a warm brooder.

A TWELVE FOOT DROP from the loft does not bother Caldwell; the beam is a guide and he feels for the edge with his toe.

Asked about his ability to get around the farm, he said, "The best way I can put it is this: It's as though a seeing person were walking around the farm with his eyes fixed on a map. He would always know where he was without looking off the map for a moment. Of course, I do get lost sometimes, and then I just wander around until I find something familiar and then I'm not lost. It's nothing to get excited about. Maybe the church bell rings or the noon whistle blows, or maybe Arthur starts the tractor. You know where the town is and where the tractor is, so you know where you are in relation to them. One day, soon after we moved here, I was out in the field and got completely lost. I walked around until I was tired and finally ended up on a little island in the middle of the creek. It was nice and grassy and the sun was shining on it so I just lay down and went to sleep. When I woke up all the cows were standing around sniffing at me."

Dividing The Work

The division of the work between Caldwell and his man Arthur, is on the basis of who can do the job most efficiently. "I am sure that, with help, I could do field work" Caldwell explains, "but I wouldn't do it as well or as quickly as a seeing person, so I let Arthur do it." Caldwell

keeps all of the records, either typing them or punching them out in braille, and takes care of the other management duties. Both of them do necessary repair work around the place, though they rarely work together on repair jobs. "I have my own way of doing things," Caldwell says, "and it is usually more efficient to work alone. I have taken our combine apart and put it together again and feel that I can make any necessary repairs on it, but when Arthur works on it I don't try to help him. We'd just get in each other's way."

Caldwell built the bull pen and dug the trench and laid a third of a mile of pipe to bring water from the pond to the horse barn. "I hired a young boy to help me line up the pipe. I could have done it alone, but you have to lift each section in the middle and since they are 24 feet long, I'm just not long enough to reach back and feel if I have it lined up with the last section."

When haying time comes, Caldwell has his hay put up by a cutom baler. He works in the field with the men loading the hay, and later unloads the wagon himself at the barn.

Arthur drives the tractor and spreads the manure, but when the spreader is empty he leaves it parked near the loafing shed where Caldwell fills it. Arthur milks the herd of 13 Brown Swiss and Caldwell feeds and cleans up the milking machine. On Arthur's day off Caldwell does all of the milking and cleaning.

"Of course, you always have something coming up that changes the schedule," Caldwell says, "like the time one of our best cows had a bad udder condition. We decided to milk her four times a day to keep her from having too much weight in her udder. Arthur milked her morning and evening and I milked her at noon and midnight. And then there was the time that we had one of them with a bad case of foot rot and I had to go out into the field and feed and milk her there."

Seeing With Fingers

Walking through the loafing shed one of the cows brushed past him, "That was

CALDWELL'S DISCERNING FINGERS scan a page of braille almost as quickly as his wife can read the same page from a book. His prized gun collection and the world of the farm, shown in the next column, are seen by him through his sensitive hands.

CALF FEED is made of kernels and meal.

A COW'S COAT serves as her name plate.

THIS IS THE FIRST CUTTING of the hay.

THE BARN DOOR has its individual texture.

Queen. I think. I didn't get a good look at her." He ran his hand along the backs of the cows as he passed, "This is Bess and this is Silver, one of our best animals." Asked how he knew them so easily he said, "They all feel different. Take Silver here, there isn't a silkier coat on any cow in the country, just feel it. You get so that the shape and texture of things is very revealing. I can tell any of the feeds we use by their feel and I can tell the difference between hay and straw or between kinds of hay either by feel or smell. When I'm walking, the slope and the texture of the ground under me is a guide that I don't miss even with overshoes on."

A friend who visited Caldwell one winter evening when he was finishing his chores says, "It was quite dark when we left the dairy barn and walked up to the other barn where he keeps his calves. Jack walked along easily and confidently while I stumbled along behind. When we got inside the barn it was pitch dark and I found that I was the blind one. I heard him set out the feed boxes and pour oats into a bucket. I knew that he must be measuring the amount, as I had seen him do, by holding the fingers of one hand at the point he wanted to fill to and pouring with the other hand. It was so dark in there that I couldn't see him as he brushed past me to put the feed boxes into the horse stalls. A moment later I heard him climbing the ladder to the loft and then the swishing sound as he dragged a bale of hay toward the opening. Suddenly I felt lost and rather afraid. When he came down, I told Jack that for the first time I knew how it felt to be blind. 'That's how you feel after a five minute taste of blindness,' he told me, 'but the feeling of being utterly lost in a dark world wears off. After a period of years you forget about it so completely that it's a surprise to be reminded that you can't see'."

At night, when seeing people are handicapped, he likes to go down to the barn and check over the cows. "I usually come down late and look them over. If any are in heat we like to pen them off quickly so that they won't do any damage. Even if I know they are all right, I like to go down and stand there and just listen to them breathing and groaning in their sleep and smell their good smell."

One of the visitors who stopped by Caldwell's farm to look over his herd was Steve Elsaesser, who had been totally blind since infancy. "My nephew asked me to go with him to look at a calf that Caldwell had for sale," Elsaesser recalls, "but we hadn't heard that he was blind. You could have knocked me over with a pin when I got out of the car to look at the calves and the man who was to show them to me told me that he was blind."

PRIDE IN CRAFTSMANSHIP is highly developed among those who have perfected their skills in spite of handicaps. Jack Caldwell works competently with metal or wood and makes minor repairs on farm machinery. He is also an accomplished pianist.

THE BLIND TEACH THE BLIND at the farm school. As the teacher guides the hand of the student over the equipment he learns its parts and how it operates.

→

Elsaesser operates a 260 acre farm on the outskirts of Cincinnati, Ohio, where he milks 38 holsteins and raises chickens, turkeys and ducks on the side. All this he does with the help of a man in his late sixties and a boy of 18. Not content with merely farming, Elsaesser has a growing retail business in milk, butter, eggs, and dressed poultry. "I am confident that I could make a living on turkeys alone if I wanted to specialize in them," Elsaesser says. "They are a good project for a blind man when you raise them on wire the way I do. These Muscovy ducks are not so easy to raise, but I like to keep them to clean up under the turkey pens where grain and mash is spilled. I raised 400 turkeys last year and sold them at slightly below butcher shop prices right here on the place.

"Chickens are another good project for the blind, either broilers or layers. A fellow should be able to do all the work without outside help. I know I do. Once I hired some fellows to help me with the culling. I generally do my own culling, but I was pretty busy at the time and thought that they could help me out. The first thing I learned, of course, was that they couldn't work like I do. I go in at night and work right down the roost, handling every bird. Why, I can spot a case of roupe as quick as you can tell your nose is running. These fellows needed light and before long all of the chickens were off the roosts and we had a terrible time trying to catch them. I tell you, sometimes people who see are a blamed nuisance."

Elsaesser moves about his farm in daylight or darkness as quickly as a seeing person could. It is easy to forget that he is blind. His youngest child, Sue, came home from school the other day filled with questions about 20-20 vision which they were studying in health class. "Do I have it, Mommy?" she asked. When assured that she did, "Do you? Does Daddy?"

During the winter months a spare electric brooder is likely to be found housing a batch of kittens, for Elsaesser is a collector of stray cats. "In the first place, I love cats," he explains, "but more important, is that I have a horror of putting my hand into a feed sack and finding a

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MANY TOBACCO FARMERS still use a wood fire, moved by a tractor, to sterilize seed beds before spring planting.

SOIL FUMIGATION

Soil fumigants promise protection against the underground pest world, much as sprays control above ground insects. New developments may make fumigation a common farm practice.

SOME of Nature's simplest organisms run man such a spirited competition for the goods he produces that the farmer must keep on his scientific toes to survive. We have been devising new bug-fighting methods since we first turned a furrow or poked a hole in the soil to plant a seed. Among the latest of this line of pesticides are the soil fumigants with which we plan to spread poison gases through the sub-surface to kill harmful bacteria, nematodes, wire worms, and weeds.

Within recent years soil fumigation has become a common agricultural practice in parts of the country producing high value crops; about 100,000 acres were fumigated in 1947, and the practice is spreading rapidly. It is being used by cotton farmers, by truck gardeners in California, the South, and other truck gardening centers, and by tobacco growers in Kentucky. As it becomes a cheaper practice its use will likely spread, and eventually it promises to take its place alongside spraying, and fertilization.

As long as there were new lands to settle, the old could be worn out, cropped out, and run down freely. But when most of the land was under cultivation the farmer devised crop rotations, cover crop programs, contouring and grassland farming. He, also, fertilized, sprayed and limed. Sprays had been designed to control above ground pests, and now by fumigating, farmers are extending this protection to the sub-surface.

Soil fumigation is the treatment of soil with fumes. The fumes may be forced into the soil as a gas, or as chemicals in solid

or liquid form which later volatilize. The gaseous types of fumigants are difficult to handle and apply. The major objection to the solids is the difficulty of mixing them evenly into the soil. The most promising fumigants are liquid.

Fumigation can control a wide variety of sub-surface pests ranging from bacteria to weeds. It can kill many types of fungi and bacteria which cause root decay of valuable crops, nematodes which feed on sweet potatoes and sugar beets, and such weeds as Johnson grass, nut grass, and crab grass. Perhaps the most destructive pest against which fumigation is effective is the root knot nematode common in nurseries, fields, and home gardens.

The nematodes are small worm-like pests that live in the soil. Their favorite foods are the roots of growing plants, and they seem especially fond of tobacco. Their damage can stunt and sometimes kill tobacco plants. The best way to detect the presence of nematodes is to examine roots for their damage.

Sterilizing the soil as protection against these pests is not a new practice. The first soil sterilization was probably done with heat from burning brush or straw. This is still a common practice among Kentucky tobacco growers who drag burning woodpiles across tobacco beds in the early spring to kill bacteria and weed seeds.

Tobacco farmers have also devised methods of forcing live steam into the beds, or drenching them with boiling water, and both of these systems are still widely used. More recently the job has been done with electrically heated units in the plant bed.

Chemicals, too, have been used for many years. As long as 70 or 80 years ago carbon disulphide was being used as a soil fumigant. New chemicals show much greater promise for soil fumigation and have played their part in a series of experiments on both tests plots and farms.

Workers in the Vegetable Crops Laboratory at the University of Florida found that they obtained 100 bushels per acre increase in marketable tomatoes when they fumigated the fields. In 1946 the same experiment station ran a test on the value of soil fumigants for cucumbers. The untreated plots yielded 251 bushels to the acre, while the areas treated with ethylene dibromide yielded 319 bushels. Peach orchards have been fumigated for nematodes in Georgia and four years after the treatment the trees on treated ground yielded four times as much fruit as those on untreated areas. Research men at the Kentucky Experiment Station planted tobacco in two adjacent beds, one of which was fumigated and the other was not. The fumigated bed produced a good crop of plants which were not bothered much by weeds. But the adjacent bed, which also got off to a good start, was soon filled with weeds which eventually crowded the tobacco plants out.

Similar encouraging results have been recorded in various experiment stations across the South. Soil fumigation, however, is spreading out of the South into the areas of high value crop production of Eastern seaboard truck crop farms, and Midwest mulchland farms producing such crops as celery, cabbage, cucumbers, and tomatoes.

The big advances in soil fumigation have resulted from the development of new chemicals for the job. Chemical companies including Dow, and Shell Oil, as well as a number of agricultural colleges and experiment stations, have been working overtime to find the best fumigants for every job.

There is no fumigant yet developed which is without some disadvantages, but several are working satisfactorily on specific jobs.

Chloropicrin. This is tear gas. It is especially effective against nematodes, fungi, bacteria, and some weeds. At temperatures above 60 degrees F. it has the power to pentrate the soil readily. The major objection to chloropicrin is its cost: materials cost from a cent to a cent and a half per square foot. This has limited its use to such locations as hotbeds, greenhouses, and cold frames. After treatment the soil should be left two to four weeks before planting to avoid damaging the crop.

Methyl bromide. This is another chemical which finds a wide variety of victims in the soil; it is effective against weeds, nematodes, and insects, as well as fungi when applied in heavy concentrations. Because it is applied beneath a canvas cover which keeps the gas from escaping, it is practical only for small areas including greenhouses, hotbeds and cold frames. It penetrates well to the depth of cultivation at temperatures above 50 degrees. The gas must be in contact with the soil from 24 to 72 hours, depending on the temperature, and as the gas leaves the soil quickly there is no prolonged wait between fumigation and planting. This gas is very dangerous to man.

Methyl bromide mixtures. Various chemical companies dissolve the active ingredient, methyl bromide, in their favorite carrier so that the fumigant can be injected into the soil without the need for covers. This gives the chemical wider possible applications, but special equipment is still needed for the job. These mixtures, like their parent chemical, disappear quickly from the soil. They are effective against insects and nematodes.

Dichloropopane-dichloropopene mixtures. This fumigant is used for many large-scale jobs as it requires no vapor seal and gives good protection against nematodes, wire worms and certain other soil inhabiting insects. It is applied with special fumigating machinery usually when the soil temperatures range between 40 to 85 degrees F. The materials cost from $30 to $40 an acre, and the farmer who uses them must give the field an aeration

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THE SWEET POTATOES on the right, ruined by nematodes, black rot, and wire worms, are from an untreated field. Those on the left were dug from a field fumigated with ethylene dibromide.

FUMIGATING MACHINERY takes many forms, ranging from hand pumps to self-powered rigs. On this one, nozzle-tipped pipes carry fumigant from a steel drum and deposit it at plow sole depth.

WHEN THE BROOD is hatched the Bobwhite hen leads her family into the world, for they can scamper around in search of food almost immediately. Their parents enter them in a Bobwhite kindergarten where they learn what is good to eat and what dangers to avoid. They are fond of seeds, grit, and insects, and stay close to cover since they in turn are tasty to a long list of predators.

WHILE the hen covers the eggs, the male guards the nest from a nearby post. His call heralds the coming harvest.

PAYING GUESTS

BY VERNE E. DAVISON

The Bobwhite, an easy-going, sociable character, has learned to get along with man. He pays his way as the farmers partner in insect extermination.

Of all the notes in nature's rural symphony the call of the Bobwhite, from the edge of a cornfield on a hot summer afternoon, is the most satisfying and heartfilling. His simple two-note call seems to tell of ripening crops, full granaries, and a world at peace.

The Bobwhite is a shy bird, leading a useful life, and it is a misfortune for him that his flesh is tasty and his flight is the sportsman's delight. This bird that asks only to be left alone to rear his young in the peaceful shelter of a secluded thicket or fence corner, leads a short and not always happy life.

The Bobwhite may live 10 years but the chances are that he will die at two or three, for most Bobwhites meet a violent death.

Spring is as good a time as any to break into the Bobwhite family circle to follow through a year of troubles and successes. In spring the coveys break up. By the time the rows of corn are showing across the fields, new families are in the making. Every female has a mate and the pair seem content to abandon all their cronies of the past winter. A few unmated cocks are whistling "Bob-white," "Bob-white" from their solitary lonesomeness. There is always a small surplus of cock birds everywhere in the Bobwhite's range. A spinster hen is an unheard of possibility.

From the time of pairing off in spring until the fall, the prospective parents devote their efforts to bringing off a successful hatch; to feeding themselves and their brood; and to protecting themselves and family against too much sun in the middle of the day and against their enemies both day and night.

Though the hen usually incubates the eggs alone, it is not uncommon for the cock to do the 23-day setting. To lay the eggs and hatch the chicks requires about 40 days. By then it is mid-summer and many quail nests are being broken up by farming activities. Still others are destroyed by floods.

Hazards of Nesting

The nests are on the ground. Snakes and skunks and numerous other wildlife eat the eggs when they can find them. Cats and dogs, and foxes and coyotes, occasionally catch the hen on the nest, destroying eggs and parent at the same time. These are natural hazards that confront every pair, every year. We are not likely to eliminate these destructive causes of nesting loss, though we can reduce them by land management, leaving nesting cover where neither machinery nor grazing will interfere. Control of predators is only a minor factor in increasing quail populations.

A nest robbed only of its eggs is but a temporary catastrophe. The hen will rest a week or two, and then begin to lay again in a new nest. Instead of being a regrettable loss, the first nest's destruction is as often a blessing in disguise in Florida and the Gulf Coat region where May and June droughts are prevalent. Dry eggs hatch poorly. High humidity is more conducive to big hatches. Be it bad or good, the parents take advantage of the situa-

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Inside A Dust Storm

BY GEORGE LAYCOCK

Wind erosion and dust storms still plague American farm lands. Scientists are learning new ways to supplement the time-tested trash mulching, grass farming, and windbreak methods of stopping wind erosion before it starts.

THE forces of nature are gradually coming under the thumb of man. We have figured out ingenious ways of combatting frost; we have built structures to control floods; we have forced reluctant clouds to give up their rain, and we're learning how to stop lightning before it hits the earth. But one force which has us stumped is the wind. Scientists are working on the wind, however, and their early findings promise the farmer new relief from destructive winds which whip up his top soil and hustle it across county and state borders to drop it on some hapless farm where it isn't wanted or needed.

Across the Dust Belt the danger of blowing top soil is still a very real threat. The danger area is a 300 mile strip of farmland reaching from Canada to Mexico, east of the Rocky Mountains. It was in the early thirties that these Great Plains, rich in fertility but poor in water resources, rose to fame in a cloud of dust that was carried all the way to the Atlantic Ocean. Now, because this land was turned and tilled excessively during the recent war, the Great Plains' farmers once again have their senses alerted to detect the first signs of a new major dust storm which many of them fear will surely come. The dust storms that whipped across Western states early in March of 1950 were perhaps the harbingers of new disasters.

The Dust Bowl farmers are not the only ones afraid of the big winds. Some areas within the Corn Belt, and others in the southern states, suffer wind erosion, especially on sandy or muckland soils. These farmers, like those in the Dust Bowl, have

worked out wind fighting techniques, but they are watching for results from wind erosion research and hoping for something better.

Dust Bowl's Past

The troubles of the Dust Bowl can be traced back to the 1880's when homesteaders moved in with covered wagon and oxen to take over the land formerly ruled by cattle men. In each wagon was a sod-breaking plow, the symbol of the times.

As far as their eyes could see there was spread before the homesteaders a limitless expanse of flat land that had no trees, no hills, and none of the comforts of home. This was the land beyond Dodge City, the land of short grass and high hopes.

The farmers made their sod houses and plowed the fields. Some years they had rain, and some they had so little that the wheat died on the dusty fields. The rains were plentiful in 1892 and the farmers had their first good year. They had planted a new wheat, Turkey Red, which was noted for its high yields; it averaged as high as 18 bushels to the acre in the best counties.

The following year, however, was a dry one and one of hot winds. So they looked ahead to the next year, but it was no better. For four years they reaped little or no grain. Some of them stuck it out, but about half of them loaded their wagons and headed back east where they could be sure of food for their families. Then in 1897 came rain, and a good crop. By the time of the first World War the world wanted wheat and the Great Plains' farmers wanted to give it wheat. They brought in tractors, combines, and gang plows; these eventually left the soil barren and exposed. They did not know it, but they had created a threat even greater than the lack of water.

In 1932 there was a big wheat harvest, followed closely by blinding, choking dust storms. Almost overnight the "Inland Empire of Wheat" became known as the "Dust Bowl." The winds were nothing new. High winds had always whipped across the Great Plains. But now that the soil was not protected by grass and decaying vegetation, the wind could lift and carry it.

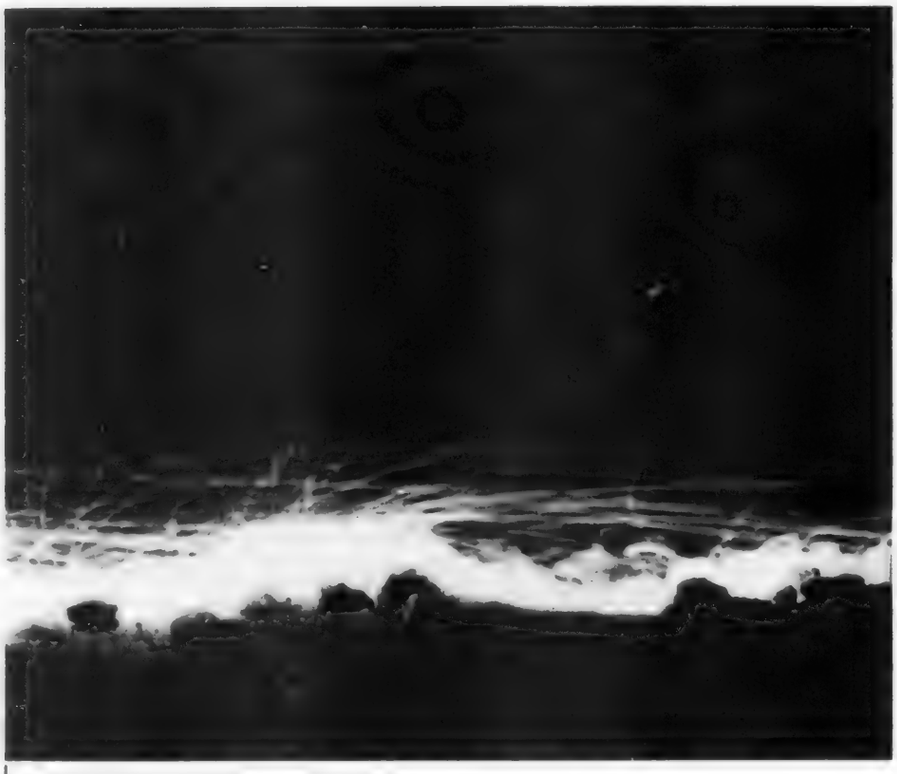
Power of a Wind Storm

And wind-blown soil can do frightening things to land, buildings, crops, and people. The sand and silt are deposited over thousands of acres of crop and range land, smothering the plant life on it. The wind driven soil often slices off plants at the surface of the ground. It blocks highways and builds up in dunes that cover buildings. Surveys revealed that, by the late thirties, wind erosion had ruined 10,000,000 acres of farm land.

This loss of the soil brings with it social ills and economic troubles for the farmers. They fail to produce a crop for a year or two and they go in debt to keep their land. After every lean year more move out, broke and hungry.

DR. CHEPIL checks a soil sample inside the wind tunnel before turning on the wind.

Farmers in the Dust Belt still have very few weapons to use in their fight against wind erosion. They sometimes plant shelterbelts, but these give only temporary and often unsatisfactory results. About as good a tool as they have at hand now is the use of trash mulch. By using disc plows instead of moldboard plows they can leave stubble and other refuse on the surface to break up the force of the wind and hold down the fine particles of soil. Much of this land is planted to wheat, and the straw, if handled properly, makes a good trash mulch. Soil experts agree that this method should be much more widely used throughout the Dust Belt. To some farmers, schooled in clean tillage,



WHAT DOES WIND LOOK LIKE?

Soil scientists at the Kansas State College have photographed wind and its movements in a special wind tunnel. Sunlight is concentrated through a set of lens. The wind is turned on and the camera records the action of flying dust as it blows from soil samples. This technique has revealed how dust particles break down clods by abrasion, and how the various soil surfaces can alter the winds course.

THE DUST BOWL was nature's revenge for many years of soil mistreatment. Every wind moved the earth; farms were uncovered, recovered, and then abandoned.

such "dirty farming" is a sacrilege. So they go ahead, plowing down all the crop litter, leaving their fields easy victims of the wind.

During the danger seasons of the year, Dust Belt farmers dash back and forth across their fields keeping the top soil stirred up with cultivators. Cultivation keeps the clods on the surface and clods seem to protect the soil. But this is only temporary relief, and what the Great Plains' farmers want is not a stop-gap, but something they can depend on to protect the land year after year.

But before research men can devise better soil protecting devices they must have a thorough understanding of the mechanics of wind erosion. Now well under way at Kansas State College is a research project which, it is hoped, will lead to a solution of wind erosion. The Soil Conservation Service decided in 1947 that it knew too little about how a wind storm works. To get the needed answers it established the High Plains Wind Erosion Laboratory, and appointed Austin Zingg, a soil conservationist and agricultural engineer, to pick up the threads of research and follow them to some logical conclusion. Dr. William S. Chepil, a soil scientist who had worked with wind erosion problems in Canada, was assigned to work with Zingg. Their first job was to find dust storms to study.

Home Made Wind Storms

They solved this problem by making their own storms where and when they found it convenient. They built a wind tunnel similar to those used to test aircraft. For the past several months their wind tunnel has been successfully whipping up miniature man-made dust storms in the basement of one of the college buildings at Manhattan.

Zingg's wind tunnel is 56 feet long. The inside is three feet square. The walls are made of panels of wood and glass; the glass windows enable the scientists to see how wind works on the soil samples they place in the tunnel.

At one end of the tunnel is the wind making machinery, a four foot ventilating fan propelled by a 31 hp engine.

"We can," says Zingg, "send a 40 mile an hour wind through the tunnel just by adjusting the throttle." Making wind in the tunnel act like wind in the fields took time, plus trial and error. The hub of the fan threw out no air. This coupled with the contours of the structure sent wind through the tunnel in swirls and eddies instead of in a straight line as Zingg and Chepil desired. A screen in front of the fan and a mass of two inch tubes straightened the wind out.

The tunnel worked well for laboratory tests, but Zingg was not content to confine his testing to the indoor variety. In addition to carrying samples of soil to his lab from all over the Great Plains and subjecting it to winds of varying intensities, he wanted to test soil in the fields

where he found it. This called for a second wind tunnel, a portable one made of aluminum which could be hauled around. Once on location the light weight aluminum wind tunnel is set up with the soil as its floor. This type of test gives the investigators a closer look at wind erosion's damage to soils as they are found on the farm.

There was also a need for a device to test the force of the wind, so Zingg and Chepil designed what they called a manometer. Tubes are inserted in the tunnel at varying heights, and the wind pressure going into the tubes is recorded on a device outside the tunnel. Dust blowing through these tubes is collected and weighed.

Before testing in the laboratory wind tunnel, soil is dried to uniform moisture content in a special oven, and to separate the soil samples into their various sizes it is passed through a special soil separator which divides it into seven sizes.

The soil under test is placed in shallow pans at the end of the wind tunnel farthest from the fan.

From this series of man-made dust bowls the scientists hope to learn several things. They will eventually know the amount of wind needed to move various sized soil particles. They will study the relationships between high winds and drought. They will know, too, what size soil particles are most likely to leave the farm by air, how rough the soil surface should be kept to halt wind erosion, and what tillage practices can accomplish in keeping the soil at home.

Soil scientists agree that wind erosion is a tricky customer. They can seldom tell what to expect of it. A strong wind in one locality may not move the soil, while an equally strong wind on the next farm may start a drift. Whether or not a soil moves with the wind is determined partly by how moist it is, but no one knows yet just what the reasons are behind these variables. "What it boils down to," Zingg says, "is that we don't know enough yet about what causes dust storms. If we can learn what causes soil to move with the wind maybe we can figure out a way to stop it."

It's a Strange Wind

Wind acts in a strange manner on various sizes of soil particles. The most difficult size for it to carry away is a particle between the size of a wheat kernel and a soybean. The large clods are subject to more damage than one would think. The smaller abrasive particles whirl along in the wind and glance off the clods, breaking them into smaller pieces. This abrasive action helps reduce the soil particles to a size which can be lifted by wind. Uneven sizes of surface soil particles make the wind change its course often as it goes across a field; small particles bounce into the air stream and are carried along and slammed against larger clods with destructive force.

Dust storms usually start in a relatively small part of a field, and Zingg is trying to learn what the characteristics of those points of origin are. "It might be," he says, "that by correcting soil conditions on these small areas many dust storms can be stopped before they get started." Samples of soil from such areas are collected during the spring, summer, and fall, and are then taken back to the laboratory and checked in the home-made wind storms during the winter.

Soil scientists tell us that much of the Great Plains' land should be returned to

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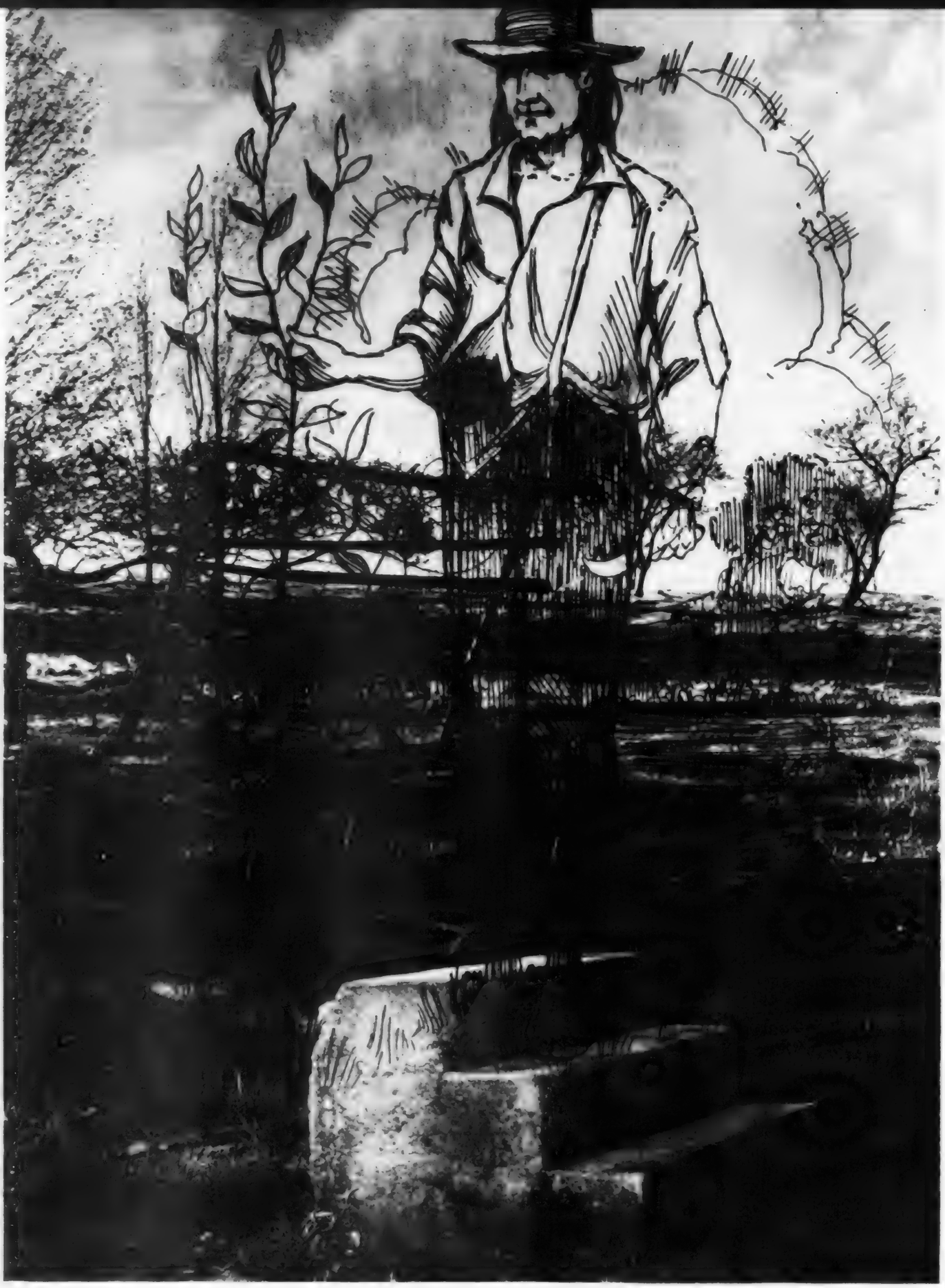
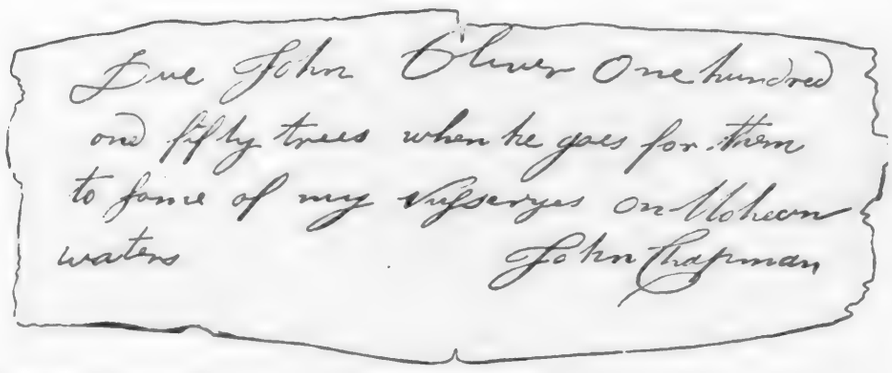
TO THE FARM BOY the little whirl winds that skip across newly planted fields seem harmless, but the soil conservationist sees them as erosion. Even east of the Mississippi, sandy and muckland soils suffer from wind erosion.



THE SHADE of Johnny Appleseed stands on the steps of the old Ferguson homestead on what is now part of Louis Bromfield's Malabar Farm, near Lucas, O. This is country that knew Johnny well for more than a quarter of a century. Local legend has it that the trees in the old orchard in the background were bought as seedlings from Johnny.

Johnny Appleseed
YANKEE PEDDLER

BY ROBERT PRICE


Due John Oliver One hundred
and fifty trees when he goes for them
to some of my Neighbours on Wheeling
waters
John Chapman

JOHNNY APPLESEED was not a frontier philanthropist, but a shrewd Yankee businessman.

It worked, at any rate, for Yankee Peddler John Chapman. There weren't many other fruit tree growers or anybody else during the half century between the 1790's and the 1840's who were footloose enough—even among the restless people who followed the frontier across America—to have accomplished such a feat.

For Johnny Appleseed's famous chain of apple nurseries ultimately reached all the way from the upper branches of the Allegheny River in Pennsylvania, down through the west foothills of the Appalachians to the Ohio River, westward across the bounds of the Northwest Territory into the heart of the new state of Ohio, up the long forks of the Muskingum River and along the land divided under the Great Lakes, until it finally reached northwestern Indiana.

It was a 400-mile stretch as the crows flew. John Chapman, however, followed not the crows, but winding streams and Indian paths through untouched wilderness, or at best the rough-hewn "traces" that the vanguard of pioneers cut through, just ahead of the first rush of settlers. So, the dozens of little appleseed plantings that eventually made his name a symbol of the taming that turned wild America into fruitful land really followed an intricately meandering route that extended more like a thousand miles before the pioneer horticulturist lay down to his well-earned rest in 1845. Even if John Chapman had not sown, in addition to his appleseeds, the magic of folk-talk that would flower into one of America's favorite hero legends, he would still hold a special place in the history of America horticulture merely by the simple facts of his remarkable nursery projects.

The story of these plantings begins in northwestern Pennsylvania, late in the 1790's; the most reliable tradition says 1797. In December of that year, the story goes, John Chapman, who had come from Massachusetts and who would have been just twenty-three at the time, showed up along Big Brokenstraw Creek in the wilderness of what is now Warren County, and there planted the first of his long series of little appleseed plots now so famous in the lore of the Middlewest.

The young Yankee had somehow gotten into this far-removed corner of the Allegheny valley ahead of the main tide of settlers. Land had just gone on sale there, but his immediate objective seems to have been to get a quantity of appleseeds growing as quickly as possible in some spot where a crop of young seedlings would be ready to sell to settlers when they ar-

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FOLKLORE HAS EXAGGERATED Johnny's eccentricities, his makeshift clothes, and even the size of his bag of apple seeds.

A WARM SUMMER SUN, silo juice, a curious pig, and now—a lost weekend.

Hogs are like that

Down through the ages the pig has amused man, provided his sport, and fed him when he was hungry

BY C. W. TOWNE
and
E. N. WENTWORTH

PIGS ARE SMART, and they are opportunists; they know a good thing when they see it.

MAN has always known the pig and he has known him both as friend and foe. Since prehistoric times he has impounded him for a pet and fattened him for ultimate consumption; he has hunted the wild boar as a sportsman, and as a farmer has tried to exterminate him for ruining his crops. The pig has been a foil for man's magic and religion, and in one way and another has provided entertainment and amusement for the master race down through the ages.

It is a legend among the French that when Louis XI was sick nothing could divert the ailing king until a troop of trained and gaily garbed pigs were brought in and made to dance to bagpipe music. Even Christopher Columbus managed to enjoy a few moments of relaxation as he watched the antics of a wild pig in a lively set-to with a monkey on board his flagship, the Capitana, as it lay at anchor, in 1502, off the coast of Costa Rica on the Admiral's fourth voyage to America. In a gesture of friendship, the natives had sent Columbus two peccaries, "the wild boar of the country," as the chronicler put it. One was returned to shore, the other kept on board. But this was so wild and fierce that it ran at everyone on deck and even forced an Irish wolfhound, which belonged to the Admiral, to go below and stay below. But before they sailed, the peccary met his match in a large spider monkey which one of the crossbowmen wounded when hunting in the forest, and brought aboard with one foreleg cut off. The peccary, as soon as it saw the monkey, bristled and retreated; but Columbus ordered them to be thrown together. The monkey, although bleeding to death, coiled his tail around the hog's snout, seized him by the neck with his remaining foreclaw, and bit the boar so that he grunted with pain. All hands roared with laughter, for tenderness toward animals was no part of human equipment in the sixteenth century. Columbus even thought it worth relating in his letter to the Sovereigns, as a novel incident and "such fine sport."

In the eighteenth century pigs appeared in person on the boards of European and American theaters, while their apocryphal antics were simultaneously being exploited in the joyful jingles of "Mother Goose.' Even today, mothers tweak their infants' toes with a sing-song lilt about "This little pig went to market" and send their moppets to the movies to see animated cartoons of Porky the Pig, and The Three Little Pigs and the Big Bad Wolf.

And Smart Too

Before 1800 our London cousins of all ages were paying good money to a Pall Mall showman for the privilege of appraising the intelligence of a "learned pig," which a writer of that day pronounced "a very ridiculous show, which . . . attracted much of the public notice, and at the polite end of town. The pig, which indeed was a large, unwieldy hog, being taught to pick up letters written upon pieces of cards, and to arrange them at command, gave great satisfaction to all who saw him, and filled the tormentor's purse with money." The full purse is easily credible, since a single admission cost five shillings, or one dollar. But like today's second run of a moving picture, the price was later reduced to half a crown, and finally to one shilling. America, too, had its "learned pigs," several of which toured the country with itinerant showmen, like Dan Rice who, when his circus was stranded in the

GREASE A PIG and turn him loose among a pack of kids; everybody happy, except pig.

FARMER JACK HOUGH'S fancy hunting hog, Barney, was recently retired; too fat.

eighteen forties, traveled up and down the crowded National Pike, recouping his fortunes by exhibiting a trained porker at the taverns and wagon stands. And, of course, the comical pig has for years been the helpful partner of the circus clown in a hundred capers.

In addition to being comedians themselves, pigs have often been endowed with humorous talent by writers of whimsy. One such produced a pig's "last will and testament" more than four hundred years ago. The story hinges on a cook's threat to butcher and cook a pig, whereupon the porker begged for time in which to write his will, most of which, in the quaint spelling of the day, ran as follows:

> I, M. Grunter Hog-son, little pig, make my last will and testament. Of all my meat and provision left behind me, first, I give unto Bore-Browne, my father, thirty bushels of Buckmast. Item, I give to my mother, Town-Sow, forty bushels of the best Weate. Item, I give my sister Whine-pig, thirty bushels of Barly, and for my bowels I bestow them in manner following: I bequeath my bristles to the Coblers and Shoomakers, my brains to Wranglers, my eares to the deafe, my tongue to Lawyers and Prattlers, my intrals to the Tripe-makers, my thighes to the Pye-makers, my loines to Women, my bladder to Boies, my taile, to young maides, my muscles to shamelesse Dancers, my Ancklebones to Lackyes and Hunters, my hooves to Theeves . . . Also shall be engraven in Golden Letters, this inscription or title: M. Grunter Hog-son, Little Pig, lived nine hundred and ninety-nine yeares and a halfe, and if he had lived but one halfe yeare longer, he had lived a thousand yeares. And you my Lovers and best counsellors of my life, I beseech you do good to my dead carkass, salt it well with the best season of Nutmegs, Pepper, and Honny, that so my name and memory may remain forevermore. And you my Maisters and kindred which have been present at the making of my will, I pray you cause your markes to be put thereunto.

There was another and quite impromptu form of entertainment for early nineteenth-century Americans. In this case, the pig had to be lively rather than learned and his two-legged competitors as agile as a cow pony at a cattle roundup. New York authorities allowed hogs to roam the streets, foraging for themselves. The pursuit and capture of these scavengers always meant sport for youngsters, and only too often misery for the hapless driver and outriders of the hog cart, a kind of Noah's Ark, mounted on small wheels, surmounted by a barred cage. While the press applauded the collecting of "these unsightly and ferocious quadrupeds . . . the efforts of the 'catchers' occasioned several ludicrous scenes," one of which, in 1825, a reporter described as follows:

> The passengers on Broadway, the thoroughfare of fashion, taste and beauty, were on Wednesday entertained with a well-contested, and for some minutes doubtful race. A good-sized pig was observed to be quietly discussing the remains of some offals, which not unfrequently adorn our principal promenades, when the cart, of course stopped and the catchers, four stout blacks, approached the animal with hostile intent, and fearful note of preparation. They had "clipped him round about" and one had actually laid violent hands on his ears, when the creature, disapproving of their proceedings, in toto, wheeled about and held the course down the street; the three "darkies," yet on their legs, pursuing at a round pace. The animal now began to pull harder, and the hunters stretched themselves to their utmost, so that the trial of speed became every moment more and more interesting. The bipeds, however, succeeded in overtaking the quadruped; but just as they were again laying ungentle hands on his body, he bolted, turned and steered back again in full cry. Finally the pursued, almost exhausted, was taken by the pursuers, seized by all fours, and introduced, to the tune of his own music, into the car. The vehicle moved onward to get another, and we trust, less difficult prey.

The Greased Pig

They probably did not know it, but those four New York negroes chasing a runaway pig down Broadway were merely engaging in a variant of a very ancient English sport, popular at fairs and wakes, known as "pig running." In this game a large pig, soaped and greased, and with its tail cut short, was turned loose. Pursued by men and boys, it became the property of the one who could catch and hold it by the tail above the height of his head. Another version of the same sport was to place a box, having a drop door fastened with a catch and containing a small pig weighing not over forty pounds, but not greased, at the edge of a larger water tank. Leading to it from the opposite side was a greased pole. Bare-footed men in bathing suits were supposed to cross on this, stoop, and release the pig. Frequently a contestant would succeed in making the hazardous crossing, only to fall in, along with the pig, when he bent over and released the catch. Because pigs occasionally drowned, the box was eventually eliminated and the young pig became the property of the man who successfully crossed the pole.

In the United States, "chasing the greased pig" for a cash prize of five or ten dollars means the pursuit of a porker weighing at least eighty pounds, well covered with axle grease or crude oil, by contestants dressed in old clothes or overalls and jumpers. At the sound of a pistol

(Continued on page 92)

CAN A PIG SWIM? Out in front, and winner, at the Seattle Pig Derby is Rose of Normandie.

AS TRANSPORTATION pigs are slow, not too sure, and unreliable. ▶

NOT A RABBIT CONVENTION, but the customary daily activity around an ordinary Australian billabong.

The Battle Of The BILLABONGS

A half billion rabbits eat enough Australian pasture to keep 100,000,000 sheep. The battle of extermination is on, but the rabbits have the edge.

FARMERS in Australia, a country about the same size as the United States, have the weather, erosion, and weeds, but they also have rabbits. They have reasonable success in circumventing the weather, they can stop erosion, and they plow out the weeds or kill them with chemicals. But the rabbits, millions and millions of them, multiplying by the hour, are a problem that prayer or poison cannot solve.

The Midwest hunter trudges up hill and down dale, all day long, and is lucky to bag his limit of two, four, or six; U. S. game experts write books about how to keep the cottontail from extermination; laws are passed.

On the other hand, in Australia, while the exterminators are grabbing a quick lunch, the prolific rabbit makes up for

the morning's casualties and has a bigger margin of fresh troops for the afternoon battle. Exploited as an inexhaustible supply of protein for human consumption, ground up for fertilizer, chopped up for dog food, starved, poisoned, slaughtered and trapped, the rabbits go right on; there are more rabbits in Australia than ever. But the rabbit, unlike the grasshopper and the locust, has an edible carcass and a pelt which is sometimes admired when made into a coat. This has set him back, but not seriously.

Australia's first rabbits arrived with the first settlers in 1788, but these seem to have known their place and contributed nothing toward the menace of today. The real trouble began in 1859 when a ship arrived from England with a consignment of 24 wild rabbits for a Victorian farmer who hoped they would increase his meat supply. They did. He gave them the best of care until he realized they didn't need any help from him. Six years later he had killed 20,000 rabbits and still had 10,000 left.

The introduction of the rabbit into Australia was another error of man in upsetting the balance of nature. The Australian climate provided the rabbit with excellent food and cover, minus the predators which in other parts of the world keep the prolific animal in check.

Today Australia's rabbit population is estimated at 500,000,000. If rabbits could be entirely liquidated Australia could carry an additional 100,000,000 sheep above the 115,000,000 it now supports, for five rabbits will eat in a year enough pasture to maintain one sheep. A big scale war to cut down the rabbits was started eight years ago and since then about 130,000,000 have been killed every year. The value of the carcasses and skins, mostly exported, has been around $11,000,000. Trapping teams take 5000 in one night. But this is a small return for the damage done to pastures and crops and much less than could have been taken off the ranges by sheep.

The rabbit was the originator of the scorched earth policy. He not only eats the grass leaves and stems but the heart of the plant as well, leaving only dying vegetation behind him. And he eats only the best. He turns up his nose at noxious weeds, which are left to flourish and do their share toward completely destroying the pasture. Grass will not grow where he leaves his droppings and when he is really hungry, as in time of drought, he gnaws the bark of trees, ringing them as effectively as a man with an axe. Ninety per cent of Australia's dust bowl problem is due to rabbits.

Recently, in western New South Wales, Australia's oldest state and principal sheep-raising area, the town of Nyngan was invaded by a plague of rabbits swarming in from the surrounding sun-scorched country. Hunger and thirst had overcome their natural timidity and they roamed the streets of the town, looking for food. Trappers caught thousands of rabbits each day, but it was like catching flies by hand in an abattoir. They substituted large-scale methods of slaughter for the old-fashioned traps and with dogs drove the rabbits through the paddocks into fenced enclosures where they were killed with clubs. They fenced billabongs (Australian for waterhole or backwater) and tanks, leaving small one-way openings in the fences. In less than three months the two fast freeze plants in the district handled 320,000 carcasses, all of which were exported.

In the vast "out-back" country of New South Wales, in the midst of the rabbit, cattle and sheep country, is Leahy Oxley's ranch. It is protected from the rabbits by a river. Robert Ruark, who recently visited Oxley, tells the story. "Leahy Oxley's ranch has been laid seige to by rabbits. Oxley is protected by a river from the rabbits, and on the bridge sits a dog. Like Horatius, he is there to keep the rabbits from crossing. Sometimes they will advance to within a few feet of him, and one day, Leahy figures, they'll rush the dog off his feet.

"If drought comes and the river shrinks, the rabbits will scurry across the dry bottom to the lush acreage and then a year-long battle will be necessary to stamp out the fast-breeding plague."

The Rabbit Tycoon

The rabbit is an ill wind which has blown big money into the pockets of trappers and meat processors. Trappers make as much as $250 a week, which is big

(Continued on page 135)

TWO FENCES totalling 2023 miles and hundreds of miles of lesser fences around crop areas hamper, but do not prevent, the spread of the rabbit scourge.

MAKING THE MOST of their affliction, the Australians have turned the meat and pelts of rabbits into a profitable export business. World meat shortages help.

DESERT SWEETS

(Continued from page 42)

undesirable as an under-ripe date. The pickers identify the ripe fruit by touch and appearance, picking only the fruit which is at its peak.

A ripe date is a fragile commodity. As they are picked they are placed in wire-bottomed trays which allow a circulation of air. They are then washed and set in a hot room which kills the bacteria and later transferred to a second hot room where they are pasteurized.

After they have been processed they are graded, and sour or unsound fruits are discarded. This is not done by taste but by hand and eye. The most skillful workers are required for this job. Bill Taylor, like most Arizona growers, markets his dates in five grades, extra fancy, fancy, choice, standard, and cooking. The better grades are packed in various sized packages for sale as a fruit or confection. The lower grades are used for candies, pastries, puddings and flavoring. Some of the growers, among them Taylor, make up their own date products under their own brands, stuffed dates, dates in brandy, conserves, fruit cakes, date and pecan bread, and others. Just recently they have learned how to can dates to preserve the just-picked flavor.

The date is highly nutritious, easily digested and tasty, a good substitute for candy for those who have a sweet tooth. It contains 50 per cent sugar, enough to preserve it indefinitely once it is processed. The mineral content is high.

How To Grow A Date Palm

The date palm may be grown from both seeds and offshoots, commonly known as suckers. The commercial groves are usually grown from offshoots since the growers know what they are getting when they plant an offshoot. Trees grown from seed are usually unsatisfactory because they are likely to be throwbacks to primitive relatives. They are about equally divided between male and female and male trees are a drug on the market. The suckers, on the other hand, breed true to form, producing fruit like the parent. All the suckers from a female will be females; all from the male will be males. A robust female palm will produce from eight to twelve suckers a year before losing her capacity for motherhood at about the age of twelve. After that she settles down exclusively to producing dates and may live to be as old as 150 years, although the quantity and quality of fruit decline as she grows old.

The suckers are taken from the parents and transplanted in a nursery where they remain for two or three years. They are then set in a grove and begin to bear at five or six years of age. They come into full production when 10 to 15 years old. A good tree will produce from 100 to 200 pounds of fruit each season, but some exceptional trees will go as high as 500 pounds of fruit.

This high yield apparently results in a handsome profit for the grower, for the going price for the extra fancy grade hovered around $1.25 a pound last season. However, Taylor and his fellow grove owners complain that the costs are so high, and so little fruit grades extra fancy, that they are lucky to make a living. The approximate cost to produce a pound of Arizona dates is eighty cents, the industry says.

The Trees in the Groves

Dates have been grown commercially in California for almost a century, a few trees coming into the state from Mexico when the Spanish owned the West. The Arizona industry is comparatively new. Walter T. Swingle, a USDA plant specialist, introduced the tree into Arizona in 1890. He brought back a few suckers from North Africa and from these most of the trees in the state have descended.

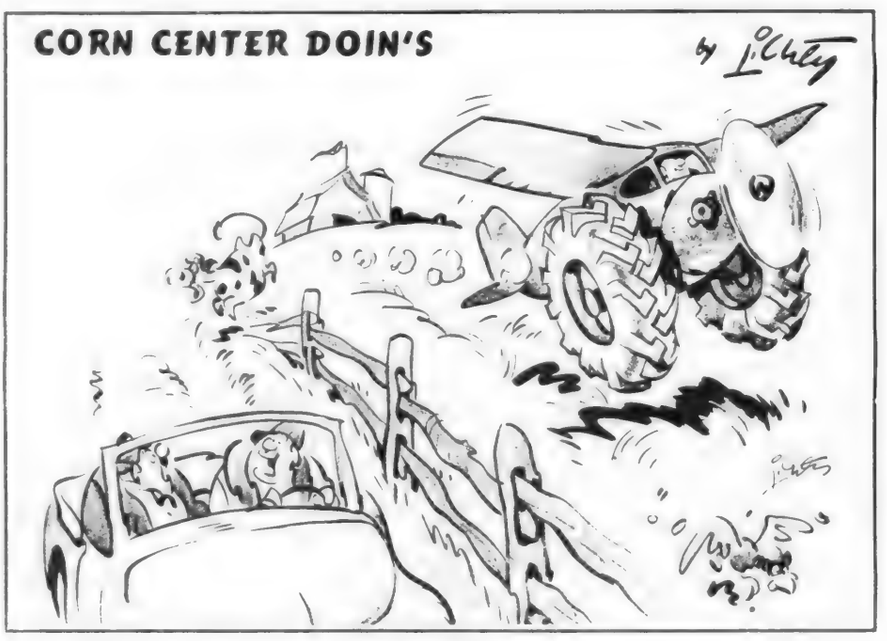
Of all the date palms growing in Arizona—and there are close to a million and a half—the Khadrawi is by far the most popular. Dark brown in color and of excellent taste, it is a fine shipper.

Another good date for shipping is the Zahidi, light brown in color, firm in texture, and piquant and nutty in flavor. Both the Kustawi and the Halawi are similar to the Khadrawi except that the former is smaller in size and the latter is loose skinned. For local gormets the Hayani is a favorite. Large and oblong, it is jet black with a luscious banana taste. Unfortunately, it is too soft to ship well.

Since the Khadrawi would seem to be the best all-around date for commercial purposes, one may wonder why growers bother with the other types. Bill Taylor has the answer. It requires, he says, twelve years to bring a palm into production, and because most existing groves include many kinds of dates, it would be anything but economical to root out producing trees and replant with new stock which would not bear for years to come. However, when an old palm dies, it is likely to be replaced with a Khadrawi.

Although date palms in most peoples' minds are associated with hot countries, they withstand cold better than citrus. In the winter of 1948-49, when the temperature plunged, it was the orange and lemon and grapefruit trees which suffered most. Although nipped by the frost, the palms survived and are in good condition today.

THE AUTHOR: Although born and raised in New England, Dick Bunnell has been an Arizona desert rat for the last 10 years. He has just taken over an old homestead and homestead shack in the Tanque Verde mountains, twenty miles east of Tucson. After leaving Yale some 20 years ago he was a cub reporter on the now defunct Bridgeport Times-Star, then moved on to join the editorial staff of the Providence Journal. During his last year in the East he edited a Connecticut weekly. In Arizona he turned free lance writer.



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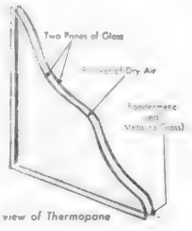

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THE CORN PROTEIN PROBLEM

(Continued from page 65)

boosted production costs, and millers, farmers, and hybrid corn producers decided that hybrid corn was the culprit.

But there was more to the picture than this. Hybrid corn was only indirectly to blame, and to understand the reason for this requires an understanding of what makes protein and where the raw materials come from. The primary raw material for protein is nitrogen and the amount of protein which corn can manufacture depends partially on the available nitrogen in the soil. When hybrid seed increased corn yields as much as 50 per cent, the nitrogen was spread over more bushels of corn and consequently each bushel had less available.

So there are two ways to increase the protein content of corn, by breeding and by fertilization. Each variety has a maximum protein content controlled by its heredity. Adequate fertilization with nitrogen helps it make its full quota of protein. Corn specialists know that the protein content of any corn crop can vary about two per cent, depending on the fertility of the soil. Fertile soil produces higher protein content than poor soil planted with the same seed.

Quantity of protein is not the only consideration. Protein varies in quality and here, too, the scientists are busy learning the fine points between corn protein quality and nutrition. Proteins are composed of substances called amino acids. These acids are nitrogen compounds and the combinations of amino acids in a protein vary and thus determine the protein quality as a feed.

Dr. Tom Hamilton, at the University of Illinois, has been feeding rations of various protein content corns to test animals, primarily rats. He is just starting to feed it under tests to hogs. "The incomplete assortment of amino acids in the proteins of corn," Dr. Hamilton points out, "is a more serious defect than the low concentration of total protein from the nutritional viewpoint."

With ruminants, including cows and sheep, the quality of the protein in corn feed is not as important as the total protein present. "For ruminants," Dr. Hamilton explains, "any increase in the protein content of corn would actually save protein concentrates since the value of proteins for these animals is measured more by total nitrogen content than by amino acid distribution."

For feeding poultry, hogs, and other non-ruminants protein quality is a major consideration and if increasing the amount of protein in corn leads to poorer quality protein, the farmer will still have to add high value protein supplements to his feeds to compensate for both total protein and low quality protein.

Increasing corn protein will probably come through increasing the proportion of hard endosperm in the kernel. Because protein in the endosperm is of poorer quality than that in the germ, an increase in corn protein may lead to poorer quality protein. "The evidence, however," says Dr. E. B. Early, Illinois expert on corn protein and soil fertility, "is that the decrease in protein quality is not significant up to 15 per cent protein in the kernel."

FUTURE HYBRIDS may be 15 percent protein.

Increasing the endosperm, or hard outer shell of the corn kernel, to increase the protein content will make the corn harder, and this too is a factor to be considered in animal feeding since stock will eat less hard corn than soft corn. Where the corn is ground before feeding this is an unimportant point.

To the corn growing farmer the problem often centers on one basic point. He asks himself, "Can I afford to grow high protein corn if I must sacrifice yield?" The answer at present is "No." With his hybrids he is still getting higher protein yield per acre than he was with the open pollinated varieties, and total protein is his major concern, especially if he feeds dairy cows. Even if he sells corn off the farm to the corn industries, he can't afford to sacrifice yield. The industries still pay no premium for high protein corn, although they have been thinking about it.

The farmer will continue to plant the highest yielding corn he can get. He should then test his soils and fertilize in keeping with the results. If he supplies all the nitrogen the crop needs it will produce as much as its heredity will permit. In the meantime, farmers, hybrid corn companies, and corn processors, have a weather eye cocked on the plant breeders. What everyone wants is a high yielding, high protein, high quality corn. We have not seen the last of the major advances in corn breeding. Bolin, and some other scientists see no reason why they can't eventually offer the farmer a hybrid seed with 20 per cent or better in protein content. Eventually everyone will be happy about hybrid corn.

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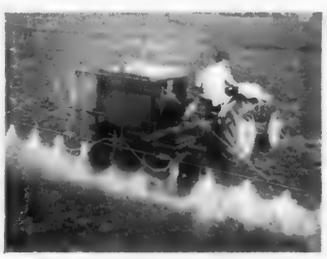

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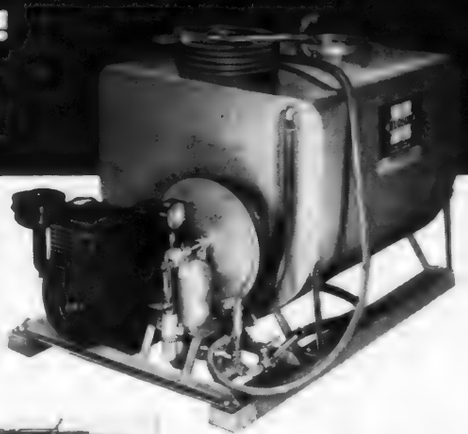
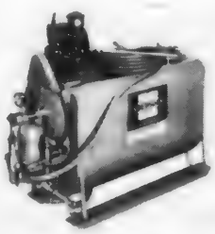
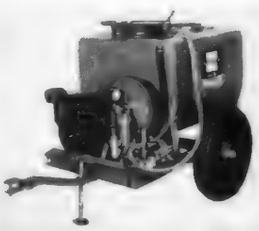




50 gallon tank. Develops 400 lbs. pressure per square inch, delivers 4 gallons per minute. May be used with spray boom or gun; with tractor, truck, trailer or wagon.



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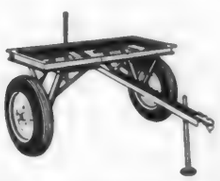

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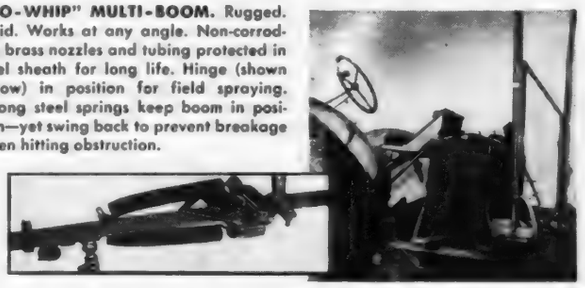

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HOGS ARE LIKE THAT

(Continued from page 84)

shot, the startled pig, stationed twenty-five yards in front of his pursuers, starts to run, with the mob hot on his heels. It usually takes from twenty to thirty minutes before the animal becomes sufficiently winded and clutching hands have removed enough grease for anyone to get a good hold. Often a man gets both arms around the pig, only to have it leap through and escape.

Can A Pig Swim?

The question whether a pig can swim seems to have been spectacularly answered in the affirmative by the historic escape and survival of "Pig 313," which pluckily leaped from a sinking ship and swam through radioactive waters until rescued, at the time that the test atom bomb was dropped on Bikini. Of the 3,352 animals exposed to the bomb, this sow was the most publicized. From a 50-pound shoat she has grown to be a 600-pounder and is living out her days in Washington Zoological Park. She is perfectly healthy, but she is sterile: the cause of her sterility is a moot question among scientists.

At the little town of Kirkland, on Lake Washington, near Seattle, a pig derby further proved the swimming prowess of pigs. On a barge anchored 75 feet off the city park, at a blast from a shotgun, 18 glamour girls in bathing suits tripped the gates to as many chutes, and 18 pigs slid into the water. 18 lanes were chocked with Poland Chinas, Hampshires, razorbacks, and assorted porkers as they headed for shore, most of them in a straight line. Except for two, which were rescued by attendants, all reached land under their own power. The winner was Rose of Normandie, owned by Pacific Farms, Indiana, with film star Bob Burns' entry, Wafford, coming in second.

There are also instances of Englishmen having trained pigs to hunt. One had an animal called Slut, which would point at any kind of game except the hare, which it ignored, and would frequently point at a bird 40 yards away. And a man named Toomer (gamekeeper for Sir Henry Mildmay) trained a sow into a competent pointer. It would quarter the ground, point, and even back the dogs as correctly as any first-class setter.

According to the Omaha Journal Stockman of August 26, 1949, Farmer Jack Hough of Portland, Indiana, has recently had to retire his talented pig "Barney" from his job as experienced hunting dog. "But he's just as good as a saddle horse," he says. "My son rides him around the yard all the time."

A British farmer living near St. Albans would often make a trip to town behind a team of four hogs, harnessed to a small cart, which he would drive once or twice around the market place to the amazement of the city slickers. Another English farmer won a bet when he successfully mounted and rode a pig from his farm to Norfolk, four miles distant, in one hour.

In France and Italy pigs have been trained to hunt for truffles, locating by scent these exotic delicacies, which grow a few inches underground. A French *abbe* thus describing the method used in his country:

> At the age of six to eight months, pigs are most adapted to doing this work, which consists of indicating the place where the truffles are found by digging into the ground to uncover them . . . All pigs being fond of truffles, after which it works instinctively, turning the earth to uncover more. With a cord encircling its neck, the animal is closely watched by the operator as it turns up the ground. When the truffles appear, the owner gathers them quickly, lest they be devoured. Sometimes, with very greedy pigs, the operator is obliged to turn the earth himself at the place indicated by the pig. To do this, he pulls strongly on the cord to hold the animal back from the place indicated, and with a wooden stick he searches the ground carefully. In order to quiet the hog, the operator gives the animal some kernels of corn or other dainties.

Some Frenchmen use a sow, experienced in truffle hunting, to farrow pigs which, through teaching by the parent, become especially skillful.

Pig In The Parlor

Those who have had experience agree that hogs can be house-broken and, like a dog, learn not only to keep their pens clean but to attract the owner's attention when they have to go out. On some of the large breeding farms of today, where the sows are raised on concrete floors and are accustomed to the routine of cleaning the pens and floors, and bedding down, very little training is necessary to teach them to go outside to answer the call of nature. A few owners even assert that the sows train their litters to such habits.

DURER'S monster. Probably never happened

The Art of Hog Calling

An essential by-product of swine raising is hog calling. To round up his steers, the cowboy and his horse must cover a lot of territory; to collect his sheep, the herder

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and his dog have to scurry hither and yon. But to entice his pigs to their slops, all the farmer has to do is to vocalize, employing a kind of Americanized version of Swiss yodeling. Although it sounds easy, hog calling requires skill, and not all hog raisers can qualify. To promote interest and improve the techniques of the art, contests were inaugurated some 20 years ago as a feature of Cornbelt farm gatherings, grangers' summer picnics, and agricultural extension meetings. As entertainment, hog calling took its place alongside barbershop quartets, softball games, dry-cracker eating, horseshoe pitching, draft-horse pulling, and corn husking contests.

In 1933 and 1934 hog calling reached its zenith when the Journal *The Prairie Farmer* and Radio Station WLS of Chicago sponsored a competition for the all-American championship at the Century of Progress. Entries for this event included district champions of both sexes from Ohio, Indiana, Illinois, Iowa, Missouri, Michigan, and Wisconsin. While thousands gaped and gossiped in the open-air theater, a dozen or more of the leather-lunged mounted the rostrum in turn and, scorning the meretricious aid of amplifiers, each apostrophized high heaven with assorted halloings, the artists ranging from baritone Stentors to Galli-Curci coloraturas. To the spectators, this vast expenditure of human voice seemed a noble but futile effort to drown out the music of the spheres. But to the critical ears and deadpan faces of a dozen judges—men and women prominent in agricultural organizations and industries — the contest had real meaning. For they had to decide the winners on the basis of the following scorecard qualifications, two judges being assigned to pass on each of the six points:

Strength of tone, 20%.

(The call must be loud enough to be heard behind a hedgerow from across a forty-acre clover field.)

Quality of tone, 20%.

(The call must be pleasant to the ear, friendly, and sweet — in short, of the proper quality not to disturb the hog's emotional tranquility that is so necessary to digestion.)

Originality of call, 20%.

(The hog must be able to distinguish one person's call from that of the neighbor's, so that he will run to the feed trough only at one's own summons.

Persuasiveness or appeal of the call, 20%.

(These qualities are important factors in enticing the hog away from the shade of a tree, a spot of fresh clover, or a patch of rich rooting ground, and persuading him to trek to the approved feed. Certain tones of endearment or sentiment should enter in, but extremely honeyed notes will not add to the score.)

Variety, 10%.

(Since the hog is a creature of delicate moods and temperament, it is important to give variety to the call. This will avoid boredom to the animal, and insure a quicker response to the contestant's call.)

Command, 10%.

(This quality is applicable only to the younger pigs. No hog raiser would presume to use a tone of command in addressing older hogs. But the judges require a modicum of command as one of the traditions of the art.)

Among hog callers there have been spirited arguments about the proper words or sounds to be uttered. In Missouri, a long-drawn-out "Who-o-oey" is accept-

WE ALL know this fellow.

able. Elsewhere it becomes "So-o-oey"; and sometimes this degenerates into "Hy-y-aa." In the North and East, where Yankees lack the lyrical and exuberant spirit, the farmer sometimes emits a gruff "P-e-eg, P-e-eg." And it must be confessed —with a red face—that pigs are occasionally summoned by the beating of a stick on an iron tub, or even by squeezing the bulb of an old-fashioned auto horn.

On at least one occasion hog calling paid big dividends. A legend of ancient Greece tells how a shipload of pirates once landed on an island in the Tyrrhenian Sea, east of modern Sardinia, where pigs were being pastured. They stole several score from the sties under the eyes of the helpless swineherds, and carried them off to their ship. Their keepers were too weak and to few in numbers to resist. But once the pigs were on board the pirate vessel, the swineherds united their voices and sent across the water the hog caller's familiar invitation. Forthwith, the legend insists, all the stolen pigs crowded to the side of the vessel nearest the shore, causing it to list so heavily that it sank, jettisoning the pirates, who promptly drowned, and permitting the porkers to swim ashore for double rations.

. . . And an Apple in His Mouth

Whatever curses may have been heaped upon his ferocious pate in life, certainly such post-mortem honors as were once accorded the head of a hog have never

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In Wisconsin, F. D. inherited a cropped-out farm. He tested every field and grain yield from 25 acres jumped from 585 bu. to 1350. His corn fields used to produce only 35 bu. per acre; now they give better than 65. His total farm yield increased 15% in just one year and is still going up.

In Indiana, A. D. was averaging 40 bu. of corn per acre, 20 bu. of wheat, and 20 bu. of soybeans. After testing his soil, his corn yields have nearly doubled and he gets more wheat and soybeans from three acres now than he used to get from four.

In Illinois, W. G. has multiplied his overall farm production three times over by following soil tests and applying the right kinds and amounts of fertilizer. His wheat yield has doubled; corn has gone up from 12 bu. per acre to 40. He's getting healthier, richer clover than ever before.

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been extended to other meat animals. From time immemorial, the stuffing and roasting of a wild boar's head at Christmas was a matter of the gravest concern to the cooks, and its serving an affair of the greatest pomp and ceremony to the nobles and gentry of old England.

Perhaps no better picture of the Christmas feast has been painted than that

WHAT'S for lunch, mom?

which appears in Thomas K. Hervey's *Book of Christmas*, published 130 years ago:

> At St. John's, Oxford, in 1607, before the bearer of the boar's head—who was selected for his height and lustiness, and wore a green silk scarf with an empty sword scabbard dangling at his side—went a runner, dressed in a horse-man's coat, having a boar's spear in his hand—a huntsman in green carrying the naked and bloody sword belonging to the head-bearer's scabbard—and two pages in "tafatye and sarcenet," each with a "mess of mustard." Upon which occasion these verses were sung:
>
> The Boare is dead, Loe, heare is his head,
> What man could have done more
> Than his head of(f) to strike, Meleager like,
> And bringe it as I do before?

So important was the office of boar's-head bearer that, in 1170, the historian Holinshed chronicled the circumstance of England's King Henry II bringing up to the table of his son, the young prince, a boar's head, with trumpeters going before him. It is thought that from this incident dates the origin of many of the English heraldic bearings featuring a boar's head.

Thus in man's lighter moments, the living pig has been a player, able to "strut and fret his hour upon the stage," and thereafter, cooked to a turn, gagged with an apple and framed in silver, he, of all the actors at Lucullan banquets, has been the star performer, his flesh the most savory, succulent, and satisfying. No one ever dreads a death's head at the feast, provided it is a boar's head.

THE AUTHORS: *Hogs Are Like That* was adapted from the recent book, *Pigs from Cave to Corn Belt*, University of Oklahoma Press, by Charles W. Towne and Edward N. Wentworth. Mr. Towne, a Brown University graduate, was for 22 years publicity director for the Anaconda Copper Mining Company and the Montana Power Company. He is now retired and lives in Tucson, Arizona. Colonel Wentworth is an Iowa State College graduate and has written widely on livestock and related subjects.

THE BLIND FARMER

(Continued from page 70)

live rat there, ready to bite me. I've done just that before I started collecting cats."

School For Blind Farmers

Elsaesser learned farming as most seeing farmers have, by being raised on a farm and doing his part of the day-to-day chores. At the time he attended school there was no course in agriculture available for the blind. Until a few blind farmers proved that it was a practical profession for the sightless, there were no organizations for the blind willing to assume the heavy financial burden of an agricultural school. In 1942, the Barnes Agricultural School for the Blind was started in New Hampshire. It became the first and only agricultural school for the blind in the world. After five years of operation it was closed for lack of financial support. Its director, Fred Ward, was later invited west by the Cincinnati Association for the Blind, however, and a new school has been started in Mason, Ohio. So far as Ward knows, the school at Mason is the only one of its kind in the world, but he is hoping that two of his former students will soon have another agricultural school for the blind started in Greece. Ward would like to see other schools opened because he feels that farming is another way of life in which the blind can find themselves. He does not, however, feel that farming is the answer to the problems of all of the blind. "The blind, as a group," Ward says, "make up a cross section of the American people. It would be just as silly to say that farming is the answer for the blind as it would be to say it was the answer for every American. For some of us it is an excellent way of life that we can enjoy quite fully in spirit of our handicap."

Plowing A Straight Furrow

Ward's work for the blind who wish to be farmers is a logical development of his own past. He too is totally blind, having lost his sight when he was a child of four, and he has operated his own farm in New Hampshire for over 20 years. In operating a general farm with dairying and broiler raising as the chief sources of cash income, Ward, like Caldwell, felt that the most economical use of labor was to hire a man to do the field work. This plan worked out very well for him until the war years when he found that he couldn't get extra help.

To meet this crisis, Ward took his oldest boy, Lawrence, who was five years old, out to the fields on his tractor. Ward started the machine, made the gas adjustments, and manipulated the gears while Lawrence sat in his lap and steered. With a little practice they developed into a surefire tractor driving team. "During the time we were driving the tractor every day," Ward says, "together we made as good a field man as you could find in New Hampshire."

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R. G. Krueger Secretary

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MARKED CARDS are fair when used at the school for the blind for a game of cribbage.

When Lawrence graduated to driving the tractor alone, his younger brother, Robert, and sister, Barbara, took their turns as apprentice tractor drivers. With Lawrence able to drive the tractor it wasn't that they were particularly needed for the job, but by this time so much family prestige had become attached to it that it wouldn't have been fair to deny them the chance to serve as their father's eyes.

Hearing A Wall

Around the farm yard Ward needs no help in finding his way about. "I did use a cane around here for a while" he says, "when we had a seeing hired man who couldn't seem to realize that there were blind people around. The day I finally decided to use a cane as long as he was with us, he left two garden tractors on the sidewalk between the house and the shop. They were so low that I didn't notice them and stumbled over one, got up and promptly fell over the other.

"Low obstacles are much harder for a blind person to detect," he said by way of explanation. "You would never find a blind man walking into a wall or the side of a building; he would sense that they were there and avoid them. There is a difference of opinion as to how we do this; some feel that facial perception is the most important and others, I among them, feel that sounds rebounding from objects is the thing that does it.

"Facial perception," he continued, "is the ability to sense the presence of an object. Mostly, we find, the sensing is done with the nerves of the face and forehead. It is like my knowing that there is a wall next to me right now. I would know it even if I hadn't felt it there with my hand. I agree that there is facial perception too, but I feel that hearing is more important.

"I can fully understand the feelings of dread some people have about blindness." Ward said with a slight shiver, "for I have the same dread of being deaf. As a a matter of fact, I was deaf for a little while during a mastoid infection and the world closed in on me. I think it a worse handicap than blindness. With sight you can only see what is directly in front of you, but you can hear sounds from any direction.

"When I was going into town a good deal I always wore leather heeled shoes so that I could hear the sound bounding off the buildings," he said, continuing his argument. "If a truck rumbled by, however, it was like a seeing person might feel when the light is turned off, for as long as the noise continued you were completely lost. It is low objects, like fire hydrants or garden tractors, that are troublesome. You don't get a good sound rebound and you can't seem to sense them by facial perception, so you often wind up stumbling over them.

"In getting to know a place you use all of your senses, of course. And they are so integrated that you rarely are conscious of using one or the other of them. Yes we do have some landmarks that we remember. I know, for instance that there is a rough spot on the sidewalk just before you reach the cement steps and I know the inward slope of the road as it turns near the shop and goes down to the barn. We teach the students as many of these landmarks as we can remember when they first come, just to save them time in getting acquainted.

Teaching Self Confidence

"Our hope in teaching," Ward con-

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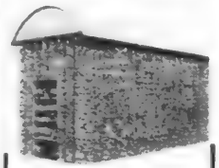

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CHOREMASTER

THE ONE WHEEL GARDEN TRACTOR

This adjustable hitch ($4.00 MAKES A POWER MOWER OUT OF YOUR PRESENT HAND MOWER

Now! New 1950 CHOREMASTER makes light work of lawn and garden chores. Quick starting, easy operation. Hitch your present hand mower to CHOREMASTER . . . shift from mowing to cultivating in a jiffy! This rugged multi-purpose Choremaster unit can also be used for weed cutting, hauling, spraying, snow plowing, and dozens of other lawn and garden tasks, 1, 2 and 3 H.P. models.

CULTIVATING

WRITE FOR LITERATURE and dealer name.

WEED CUTTING

MOWING

CHOREMASTER DIVISION
THE LODGE & SHIPLEY COMPANY
806-3 Evans Street Cincinnati 4, Ohio

tinued, "is to give the students as much theoretical training and as much practical experience in farming as we can in a one year course. The main emphasis is on actually doing the various jobs so that when they leave here they will have enough self confidence to tackle any job that normally comes up on the farm and go on from there."

The school started out in the fall of 1949 with one student. Edward Konieczski, who came to the school from Michigan where he had had three years of High School Vocational Agriculture. In February of this year their second student was enrolled. James Richard, a veteran from the last war with no previous agricultural experience. Eventually the school hopes to have 12 students with three instructors.

Learning by Doing

Instruction must be on a personal basis. To introduce a city-bred boy to the intricacies of damp rake, for instance, Ward must first explain the function of the rake in farming and give a general description of it and of the other equipment that could be used in doing the job of gathering hay. He then takes the student by the hand and goes over each part, feeling the general shape of the machine. He then explains the relationship of the parts and how they function together.

In teaching electricity, plumbing or carpentry the instruction includes the actual use of tools. The project in carpentry, used in teaching Edward Konieczski, was the construction of roosts for the chicken coops. Konieczski helped Ward build one of the structures, a sturdy table with a hinged, wire-covered top, and was then permitted to make one entirely on his own. A seeing poultryman who saw the roosts said, "They're too good. You just don't do such a finished job for chickens." The neat firmness of the joints, the alignment of the boards, the fit of the hinged top to the table, and the finish was as good as that generally found in kitchen furniture.

Whenever possible, regular farm chores are used for instruction. A student learning about cows and milking will take care of some of the cows in the school herd and run the milking machine; classes in poultry raising are conducted while working in the coops. At times a job that has been set aside for instruction work just won't wait. "We were milking the other morning," Konieczski says, "when the milking machine motor slowed down and began to smell. We figured that the trouble was in the switch. Mr. Ward had promised to let me help him install a new switch, but the one that they had sent out was a kind that he had never used before so he was waiting for another to come before we tackled the job. Well, when the motor started heating up, Mr. Ward turned off the switch, but the motor kept right on running and the burning smell got worse. Later we found that the heat had fused the switch. Mr. Ward jerked the wires out

GROOVES INDICATE the measurement on this ruler that Caldwell uses for carpentry.

of the switch box, shut off the electricity at the meter, studied the new switch, and in a few minutes he had the new switch installed and the machine running again."

The students are taught field work with different crops and different pieces of equipment. "I know that field work is not efficient for the blind," Ward explains, "but they should have it in order to understand the management problems involved. Furthermore, there may come a time, as there did with me, when you either know field work and do it or you fail as a farmer."

Farm Books for the Blind

Most of the instruction must necessarily come in lecture form since there are a very limited number of agricultural books that have been written in braille. Poultry farming is best covered, with several standard books and bulletins in braille: dairy farming has but six bulletins; hog raising has one and home gardening a single bulletin. The number of texts indicates the current belief as to the types of farming most suitable for the blind, with poultry and dairy way ahead. Ward feels, however, that for those who want to devote themselves to management there is no branch of farming that is closed to the blind. "It depends on the individual" he says, "just as it depends on the individual whether or not he should be in farming at all. At the school here we are most concerned with whether the student has the proper aptitudes for a farmer. We take them on probation for two months, during which time we watch them very closely to see if we think they fit into the life."

Those who do love the life of a farmer and are able to adapt themselves to it go on with their studies. The life they have chosen will be difficult, but it will also be rewarding. They at least know that others with the same handicap have made a success of the job and have shown that the eye that fatteneth the ox can be replaced by the touch of hands that can see, and ears than can make visual the sounds that come to them.

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ONE-MINUTE 3-POINT HOOK-UP From Tractor Seat

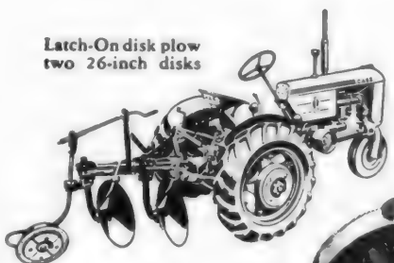
With the improved Case "VAC" you just back into position . . . pull a cord to open the latches . . . touch the hydraulic control, and the twin jaws of Eagle Hitch engage the Latch-On implement. Insert one pin . . . without getting off tractor seat . . . and GO! No lifting, no tugging, no tools needed.

Eagle Hitch lets rear-mounted moldboard plows float free, holding their depth in hard spots and uneven ground—just like an old-time expert with walking plow. New low-pressure hydraulic control lifts the whole implement high and clear—also adjusts depth when desired, as with disk-type implements.

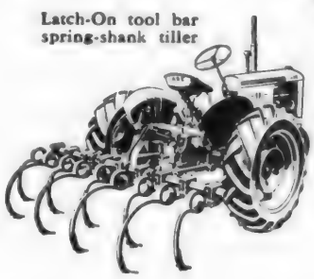
✓ NEW HYDRAULIC CONTROL . . . *ENGINE-DRIVEN—*
ACTS INSTANTLY, MOVING OR STANDING

✓ NEW LATCH-ON IMPLEMENTS
THAT HOLD THEIR DEPTH

Latch-On disk plow two 26-inch disks

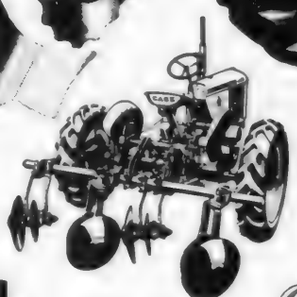


Latch-On tool bar spring-shank tiller

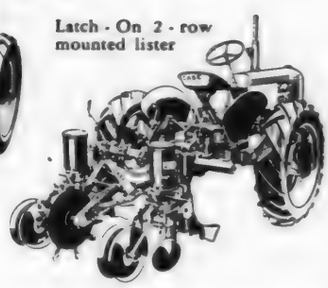


Latch-On 2-way plow one 16-inch furrow

Latch - On bedder and cultivator



Latch - On 2 - row mounted lister



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- ☐ 3-plow "DC" tractor
- ☐ 4-5 plow "LA" tractor
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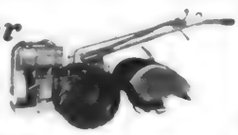

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The weeds'll be back full force in the spring . . . but you can lick 'em easy with Jari. It kills weeds two ways! Its yard-wide sickle bar slices through the toughest growths . . . and its 14 foot weed spray attachment covers your lawn or garden fast . . . keeps weeds from coming back. Cut fencerows, ditch banks . . . spray insecticides in row crops, truck gardens with this light, nimble new Jari. Write for your dealer's name now. Be ready for spring.

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Jari POWER SCYTHE

New Jari Pressure Spray Attachment. Holds 10 gallons . . . sprays 14 feet wide.

COME NEXT FOURTH, after the oyster supper, they will have new uniforms.

SWEET MUSIC

BY JOHN GOODWIN

THE old-fashioned brass band has done more, to my way of thinking, than any other one thing to make our country the great nation that it is. The yeast of democracy never bubbles harder than when two dozen barbers and grocery clerks and farmers tear into the *Star Spangled Banner* or *Columbia, the Gem of the Ocean.*

In my day a brass band marching down Main Street on a Fourth of July and bursting forth with *Yankee Doodle* was positively the grandest sight on earth. On it marched, with firecrackers popping all around. I remember once when a small boy tossed a cannon cracker into the bell of a bass horn. It made the loudest and most explosive note ever to come out of a horn.

The more runaways a band caused, the better it was liked. In my home town every Fourth of July parade caused an average of three runaways. When the band came abreast of a skittish team of geldings, they would rare up on their hind legs, and then amidst the screams of women and the cries of children the terrified horses would plunge down the street. I know of nothing that gave a person more downright wholesome excitement than a team of runaway horses.

Parents who exercised careful and profound judgment in assisting their sons in choosing a band instrument were well rewarded. If a boy had buck teeth and a receding chin, a wise father steered him away from a horn. Squint Peabody was a perfect case of matching the boy to his instrument. Squint had a mouth that puckered like a black sucker's, giving him a perfect down-draft for a piccolo.

Of course, a 200 pound man looks a bit ridiculous as he clutches a piccolo against his bosom and waits through almost an entire musical selection until it comes his turn to blow a few tweets. He feels that life has sort of passed him by. But on the whole, piccolo players get as much fun out of life as anybody. In our band we always ranked the piccolo player as a panty-waist. We thought he blew a little more into a piccolo than he ever got out of it.

There was an old axiom that the village innocent always played the bass drum. But I wouldn't say that. My Uncle Pod Goodwin was a bass drummer—and an excellent one. He wasn't really deficient; he just looked dumb as he sat on the edge of the bandstand and banged away on his drum. He didn't know any music and he didn't have to know any, and since he wanted to be in the band we thought he would do less damage beating a drum than blowing a horn.

Picture in your mind's eye the town park on a balmy summer evening with the bandstand gaily lighted and with the gold braid and the gold buttons of the musicians' uniforms reflecting little beads of light. There comes a dramatic pause in the music—and then the cornetist rises and points his horn heavenward. With bated breath the audience follows the silvery notes until, finally, the band director's baton drops to his side. The cornet-

ist resumes his seat amid a thunderous wave of applause.

Any man who can remember back to the time he played a silver cornet solo need never feel that his life has been lived in vain.

Not far behind the cornetist in prestige was the trombone player. You could spot a trombone player's wife any time because she was so thin and pale and nervous. Any woman who had to listen to her husband practicing a trombone smear night after night for weeks was bound to have bulging eyeballs and the whim-whams.

In the good old days a town was rated by the number of musicians in its band and by the elegance of their uniforms. A brass band with an oboe and a French horn was considered very de luxe.

Financing a band often was a serious problem. Some bands had to play in the red year after year. But loyal boosters of a really progressive town took it upon themselves to raise a band fund every year. It was understood this fund was to be used to buy uniforms; then, if there was a balance remaining, that, according to well-established precedent, was to go for an oyster supper.

Unfortunately, for some reason, band players were very fond of oysters. I remember our band boys once voted to treat themselves to oyster suppers very early in the season. Nobody seemed to keep in mind the exact amount of the surplus, and it turned out the boys ate so many oysters that the new uniforms, figuratively, went down their throats.

It's my firm conviction that when the small town band went out, treason, disloyalty, and subversive activities came in. I just can't imagine a subversive band member; he blew all his primitive urges right out through his horn. And it was hard for the bystander to feel anything but complete loyalty when the boys got wound up and ripped into Sousa's March. Rural life lost something fine and honest when our band played its last concert, and to my way of thinking, we haven't been the same since.

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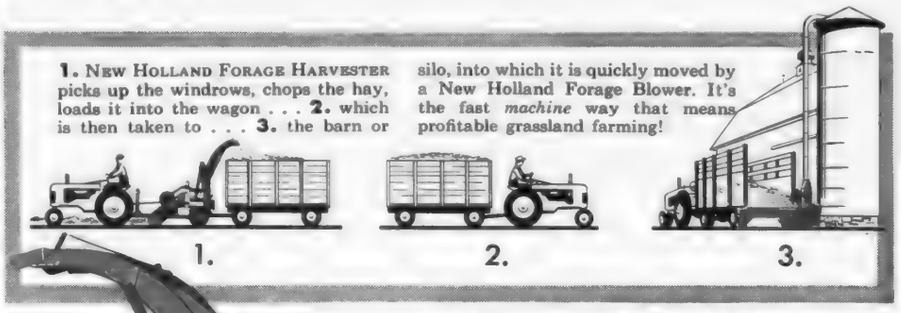

ONLY THE NEW HOLLAND FORAGE HARVESTER GIVES YOU ALL THIS

- You can start, stop or reverse feeding action *from the tractor seat.* Reverse prevents clogging. Deflection angle on discharge pipe is controlled from tractor seat.
- Discharge pipe easily turns to left side, right side or rear *without changing supports* or removing pipe.
- Throat opening of *112 sq. in.* handles up to 6 tons chopped dry hay per hour . . . up to 20 tons corn.
- You can change from windrow pickup to row crop attachment, or vice versa, *in 45 minutes or less* (only 5 bolts).
- Continuous crawler-type upper apron is *exclusive* New Holland advantage. Gives positive, even feeding, prevents jamming.
- Four-knife flywheel is precision-balanced. *Slices* like a knife . . . not scissor action.
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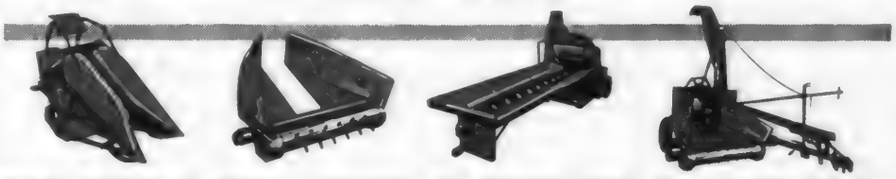
"The field forage harvester . . . saves considerable labor, permits more timely haying operations during unfavorable weather, and eases the work, particularly in making grass silage." —*from University of Wisconsin study.*



Row crop attachment cuts corn stalk at butt, lifts it onto feeder apron *base* first. Will chop and blow up to 20 tons per hour.

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New tilt-table blower has low 22" operating position. Moves up to 30 tons of chopped hay per hour . . . 40 tons of silage.

New power take-off Forage Harvester operates with full efficiency from tractor with power takeoff of 31 h.p. or more. Cost is $617 less.

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Please send illustrated literature on Universal Pumps and the name of my nearest Universal Dealer

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REED CANARY GRASS

(Continued from page 53)

gradients. It increases the cleaning out problem.

He has also "waterproofed" large gullies with from 80 to 300 acres of watershed above by plowing cone-shaped furrows across the waterway at ten to fifteen foot intervals. Sod strips plowed from his sod bank were placed in the furrows. The tractor wheels were used to pack and firm the sod in the prepared furrows. He says, "I am convinced that terracing, contouring and plenty of sod crops in the rotation, together with waterways held down by canarygrass, are what is needed in this part of Iowa to keep our farms from wandering off down the Mississippi."

To obtain a solid cover in a gully or ditch bottom within a year the sods should not be placed farther apart than 15 to 18 inches. Some farmers having several miles of gullies have found it practical to start the sodding at the upper end of the gullies. From these treated areas seed spreads down the gulley until eventually all is under sod.

Many Iowa farmers are using their sod banks as a source of seed. Seed can be obtained by heading about the third week in June. Just as the heads begin to shatter, they are cut with a sickle, placed in a grain bag and dried. The seed is used for additionl sod bank seedings around farm ponds, overflow creek bottom areas and on poorly drained spots around the farms.

The preparation of the seed bed in a bog or swamp may be a problem if it is wet the year around. One of the methods described above may be used. Broadcasting the seed has been only rarely successful.

Highway builders are becoming aware of the value of reed canarygrass as an erosion control on highways. Instead of dumping rock or building structures to dam roadside gullies, they are establishing sod banks and using reed canarygrass sods in roadside ditches. An increasing number of counties are including the use of reed canarygrass sods in the solution of their erosion problem along local roads. This practice is stretching the tax payers' dollar. It is conservatively estimated that there is a place for two million living reed canarygrass dams in gullies on farms and roadside ditches throughout the central Corn Belt.

Feeding Value

Reed canarygrass hay cannot be compared to alfalfa or good clover hay. When fed to beef cattle, dairy cattle or sheep, a grain ration with additional amounts of concentrates such as cottonseed meal, linseed oil meal or soybean meal is recommended. The hay alone is considered a good maintenance feed for wintering cattle.

Following are some analyses of reed canarygrass compared to other forages:

FORAGE	DIGESTIBLE PROTEIN	T.D.N.
Reed Canarygrass Pasture	3.6%	— —
Reed Canarygrass Hay	7.5%	46.6%
Timothy Pasture	4.7%	——
Timothy Hay	6.2%	46.9%
Alfalfa Pasture	5.4%	——
Alfalfa Hay	14.7%	50.3%

(Analyses from Morrison's Feeds and Feeding.)

When to Plant

There are three times during the year that reed canarygrass can be satisfactorily sown, (1) spring, (2) late summer, and (3) late fall just before the ground freezes. Usually a summer seeding is best on poorly drained or overflow creek and river bottoms. Such areas can be worked when dry and the weed competition is reduced to a minimum. Wherever field conditions permit and weed competition is not a serious threat, spring seedings are satisfactory. A late fall seeding is advisable on some of the poorly drained areas. The seed will germinate and start very early the next spring.

June harvested seed planted the following August on well prepared seedbeds has produced excellent vigorous stands. Handled in this manner it has more seeding vigor than many of the common grasses.

Seedbed

A well prepared seedbed is recommended. Much seed has been wasted by broadcasting it on weedy, swamp areas. A few farmers have established stands in this manner, but many more have little to show for their efforts. Where possible, prepare a good seedbed, similar to that for alfalfa. If a summer seeding is planned, try to plow the area four to six weeks in advance of seeding so it can be fallowed to accumulate seedbed moisture and control weeds.

When soil crusting is not a hazard, the use of the cultipacker or roller is recommended in the seeding operations. The seedbed can be firmed and grooved with a cultipacker after which the seed is broadcast. To cover the seed, cultipack or roll the field in the opposite direction. This gives nearly an optimum depth coverage of about one-quarter inch.

A pound of reed canarygrass seed contains approximately 575,000 seeds. If evenly sown over an acre, it would amount to 13 seeds per square foot. When good viable seed, (90 per cent or more germination), is used, a seeding rate of five pounds per acre on a good seedbed is adequate. The usually recommended seeding rates run from four to seven pounds per acre.

Reed canarygrass can be seeded with the ordinary farm seeding equipment, endgate seeder, drill, or the hand operated tin-horn and cyclone seeders.

Until 1924 most of the commercial seed dealers handled imported seed from Europe. More recently seed production has developed in the Pacific Northwest and in the North Central states of Minnesota, Wisconsin, Michigan, and Iowa.

Seed yields will run from practically nothing to as much as 350 pounds per acre. The seed shatters very readily when ripening and must be harvested in a short period of time and handled very carefully if heavy losses are to be avoided and high quality seed obtained. Immature seeds are green or straw colored.

The seeds ripen from the top of the head downward so that there is ripe seed in the upper part when the lower part contains only green seed. There is only a period of a few days when the crop can be harvested without heavy loss of seeds. Fields to be harvested should be watched and studied daily during the last half of June.

Small areas of canarygrass can be harvested by hand. The heads can be gathered in by one hand and cut off with a pocket knife, sickle, or scissors and dropped into a tightly woven bag. Keep the heads in an upright position until they are dropped into the bag. The bags of heads can be hung up to dry before separating the seed.

Areas of an acre or more should be harvested mechanically. Old binders have been satisfactorily rebuilt by removing the knives and guards and gearing up the reel so that it will operate at a rapid rate and beat out the ripe seed. The seed is dropped directly from the reel into a box on the platform. With proper height adjustment of the reel little damage will be done to the standing crop and the operation can be repeated two or three times as the seed ripens.

The combine is probably used more than any other machine to harvest reed canarygrass. It should be equipped with a high-lift attachment to allow as few green leaves as possible from going through the machine. There will be both dry-ripe and green seed harvested. Therefore, it is very important that much attention be given to the drying of the seed. The seed should be spread out on a floor, not more than two or three inches deep, and stirred with a garden rake every three or four hours the first two days after harvest.

The U. S. Soil Conservation Service Nursery at Ames, Iowa, obtained the greatest seed yields of reed canarygrass by growing it in either 36 or 48-inch clean cultivated rows and applying nitrogen fertilizer as needed. From 60 to 80 lbs. per acre of elemental nitrogen applied in the spring following the first year of growth is necessary to maintain high seed yields. The row yields for two years averaged 205 pounds as compared to 57 pounds per acre for the seven-inch drills.

Cost of Seed and Culture

Commercial seed has been costing from 40 cents to as much

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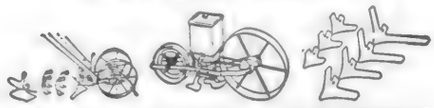


as $1.25 per pound in recent years. Seed costs per acre will range from as little as $2.00 to as much as $5.15, depending on the price of seed and seeding rate. It costs no more for seedbed preparation and seeding operations than for the commonly used grasses and legumes on rotation land.

Although one of the heaviest rooted of the common grasses, it can be subdued readily with the plow. It requires more power to turn up the mature sod than it does for other grasses. It is recommended that the sod be plowed late in the fall or early spring.

Disadvantages of Reed Canarygrass Compared to Other Grasses:

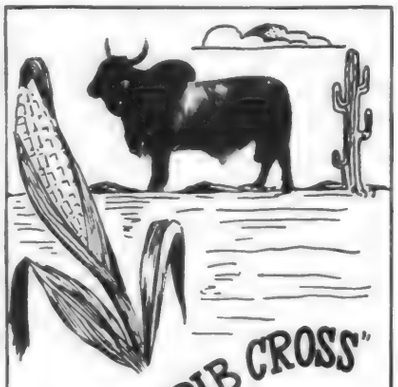
1. Because of its vigorous and rapid growth, it requires better management to maintain a legume with it.
2. Unless the growth is kept down through grazing, it is not relished by livestock as it matures.
3. In some situations on low ground and because of heavy growth, it is harder to cure for hay.
4. More difficult to harvest seed because of shattering.
5. Harder to plow than other grasses.
6. It may spread to unwanted fields if not closely controlled.

Advantages of Reed Canarygrass Over Other Grasses:

1. The most productive grass to grow on swampy or overflow land.
2. Has no equal as a gully control grass in the Midwest.
3. Makes an excellent waterway grass in those areas where seepy or wet spots exist.
4. On areas where adapted, makes good quality hay or pasture when properly fertilized and managed.
5. It turns waste areas into productive acres.
6. It associates well with Ladino clover because of its fast recovery after clipping or grazing.
7. An unexcelled grass to use in tying mechanical structures such as earth fills, road culverts and concrete flumes into the earth where moist, seepy conditions exist.

THE AUTHORS: Walter Weiss was born and raised on an Iowa farm. He was graduated from Iowa State College in 1928, with a B. S. degree in agriculture. He taught Smith-Hughes agriculture and was county agent in northern Iowa prior to 1935 when he joined the staff of the Soil Conservation Service of the United States Department of Agriculture, Milwaukee, Wisc.

Maurice E. Heath was also born and raised on an Iowa farm. He received training in agronomy at Iowa State College and since that time has been with the Soil Conservation Service. Until 1948 he had worked on grassland problems in Missouri, Iowa, Minnesota and northern Illinois and conducted developmental work on grasses and legumes in Iowa in cooperation with Soil Conservation Districts and the Agricultural Experiment Station. More recently he is directing similar work on grasses and legumes and vegetative field problems for the Soil Conservation Service in the 12 Northeastern States.



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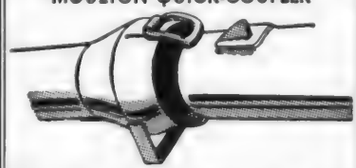

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SOIL FUMIGATION

(Continued from page 73)

period of from two to four weeks. These mixtures are widely sold as DD. Another chemical with similar abilities and characteristics is ethylene dibromide, also sold in mixtures.

Uramon. This chemical is a solid, organic nitrogen compound. It is applied by mixing it with the top four to six inches of soil at a rate of one-half to one pound for every square yard. It requires no special machinery for application. The soil must be well prepared, plowed, and worked down to mix the chemical uniformly with the soil. It is effective against weeds, nematodes, and will help control fungi and bacteria on lighter soils. Many farmers add one part Cyanamid to every two parts of Uramon to make what is known as the "combination treatment." It is used

METHYL BROMIDE, effective against weeds, nematodes, and some insects, is applied beneath a canvas, and used for small areas.

widely for the preparation of tobacco beds, and should be applied in the fall preceding planting since at least 90 days should elapse before the bed is planted. This is not one for large-scale treatment.

Cyanamid. This is another nitrogen compound and it is applied in the same manner as Uramon. Cyanamid is more effective against weeds and less so against nematods than Uramon. Tobacco farmers prefer to mix them for the "combination treatment" instead of using either alone.

What Machinery?

One of the things that has limited the spread of soil fumigation is the tardy development of fumigation machinery. Within the past five years, however, farm implement manufacturers have designed a wide variety of new soil fumigating machinery, so that today there is a machine to meet practically every situation. They range from simple, inexpensive hand pumps, to complicated tractor-drawn trailers equipped with mazes of tubes, disks, and tanks. Some of the simplest and most effective fumigating devices have been inexpensive attachments to be bolted to the tractor at plowing time so the chemicals can be dropped in the furrow behind the plow, for a one-trip operation.

Fumigating rigs can be made in the farm shop. One that has been made by several Florida farmers needs only five or ten dollars worth of materials including a ten-gallon steel drum, a piece of tubing and a couple of discs to open a shallow furrow beneath the tractor where the chemical is run into the soil. The drum is mounted on the front axle of the tractor. The copper tube runs from the drum to the ground in the center of the furrow made by the discs. There is a shut off valve at the base of the drum and a regulator valve in the tube to control the chemcal's rate of flow.

Considerable soil fumigating is being done by custom opera-

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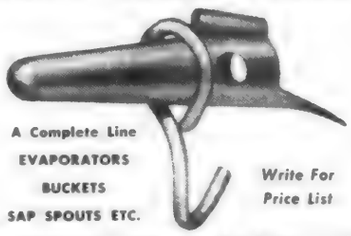

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tors. In some cases neighboring farmers have joint ownership in fumigating machinery. There are so many types of machinery for this operation in existence now that before a farmer takes up the practice on a large scale he should check with his equipment distributor and county agricultural agent for the ones best suited to his particular needs.

The major aim of the farmer applying soil fumigants is to place the chemicals where they will do the best job at the least expense. Fumigant placement can vary for different crops. For plant beds, the entire surface must be treated, while for row crops, especially cotton, placing the fumigant in the row reduces the amount needed per acre by about one-third. For widely spaced crops, including watermelons and orchard trees, the fields can be spot or site treated so the chemical is placed near the plant and the rest of the area is left untreated.

Soil fumigants should generally be applied in the fall instead of spring. This allows the chemical time to volatilize from the soil before planting. The safest chemical for spring application is ethylene dibromide where the crop must be planted soon after treatment.

Overall treatment of fields to be planted to tobacco, vegetables, or flower crops are usually profitable in infested soil. Tobacco farmers have tried applications at reduced rates applied in the furrows, but with unpredictable results. All of these points are still getting concentrated research and the scientists are the first to point out that there are many questions still unanswered. However, the overall treatment of nematode infested tobacco soils has consistently given yield increases of from 200 to 400 pounds per acre, a noteworthy profit in any man's tobacco patch.

The easiest soil to fumigate, and the ones which show the best results from the treatment are the loose soils, such as sandy loams. Heavy soils need careful treatment before fumigating. The soil should be uniformly loosened to the depth to which fumigation is desired. A plow sole can stop the penetration of the gases Any type of soil, however, according to the Texas Agricultural and Mechanical College, can be effectively fumigated if moisture, temperature and tilth are correct and if the gas can be confined long enough to do its job.

Fertilizers, including manure, should be added to the soil before fumigation instead of after. The soil should be plowed and the large clods worked down to make a uniform seedbed. There should be a two week interval between the removal of the previous crop and the fumigation since nematode control cannot be effective if live roots remain in the soil.

It is safest to re-fumigate a field every year if it is being used for the production of high value crops. A new crop of pests can build up rapidly enough to make the second year's crop a gamble.

Fumigate the Home Garden

While soil fumigation is not yet a widespread practice for large field treatment, it is being increasingly accepted by the home gardener, whether he plants his beans in the sand hills of Michigan, or the heavy soils of Maine.

J. C. Ford, garden specialist at the Alabama Polytechnic Institute, has been telling farmers how they can make their own equipment, at no cost, and practice successful soil fumigation in their home plots. In most gardens the major pests to control by fumigating are nematodes and wire worms. The chemical to use is an ethylene dibromide mixture, marketed by Dow, and the Shell Chemical Co. The equipment is a quart fruit jar and lid. Make a nail hole along one edge of the lid, and another hole along the opposite edge through which air can enter. One quart of the chemical should be applied to every 100 feet of row after the soil has been prepared. The gardener can spread the fumigant evenly enough to do a satisfactory job by walking at a steady pace back and forth along the row two or more times until the liquid is gone. The fumigant should be covered with soil immediately. From two to four weeks should elapse before planting.

The soil fumigation treatment is wasted if the soil is reinfested with nematodes taken in on plants from contaminated soil, tools, irrigation waters, or manure.

Information on Soil Fumigants

Material	Dosage lbs. per acre	Cost of material per acre	Method of application	Relative effectiveness against				Approximate number of days between treatment and planting
				Nematodes	Fungi	Bacteria	Weed Seeds	
Chloropicrin	450	$360	Inject into soil with special applicator	Good	Good	Good	Fair	15-40
D-D	300-600	$45-90	ditto	Good	Poor	Poor	Poor	10-30
Ethylene dibromide	200-300	$50-80	ditto	Good	Poor	Poor	Poor	10
Uramon	2400-4800	$75-150	ditto	Good	Fair	Fair	Good	90-180

Courtesy *Research and Farming*, N. C. State College of Agriculture.

Take Care

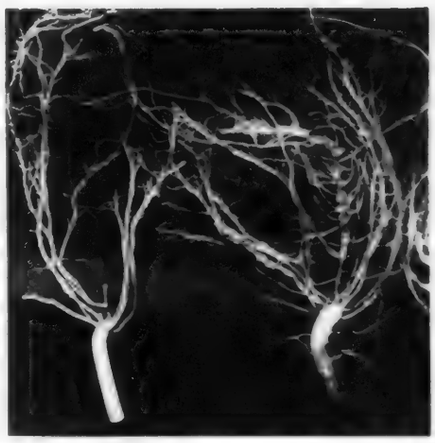
Soil fumigants are poisonous and the person who would be safe in using them should abide by the following rules: 1. Do not breathe the vapor; 2. Do not get the chemical in the eyes or on the skin; 3. Wash with soap and water any parts of the body which the fumigants touch; 4. If it is spilled on clothing, remove the clothing and wash it immediately; 5. If spilled on shoes, remove them and do not wear them until they are completely dry again; 6. Do not allow fumigants to get on valuable plants or animals; 7. Keep the containers closed when they are not in use.

It Has Its Bad Points

Soil fumigation has its flaws, and the chances are that they will never be completely removed. In addition to harmful nematodes and fungi, it also kills earthworms, and beneficial nitrifying bacteria. True, soil fumigation is a radical departure from what farmers have long practiced since it, in effect, removes all types of life from the soil. G. Steiner of the Bureau of Plant Industry at Beltsville, Maryland, says, however, "There exist no records that demonstrate an ill effect from the more or less total elimination of a life community from a soil either through sterilization or fumigation." There are many who would argue with Mr. Steiner, but, perhaps, with equally negative evidence to back up their views. This argument must, at least for the present, resolve itself into two camps, those who don't want to kill any of the life in their soil, and those who figure that it doesn't make much difference one way or the other. One point to keep in mind is that present day soil fumigation aims not at total elimination of soil life, but the reduction of organisms in it to the point that increased yields pay fumigation costs. Many soil specialists point out that even though life within the soil may be eliminated the bacterial populations rebuild very rapidly.

One of the major objections which farmers still find for soil fumigation is the cost. When the cost of treatment is reduced to one half its present figure, interest will pick up in the idea. Until then, fumigation for low value field crops holds little promise simply because farmers couldn't make it pay off in increased yields.

There is still no truly selective soil fumigant. The user cannot go to his dealer and order a fumigant which will kill nematodes but not beneficial bacteria. Some are more effective for certain organisms than others, but they are not selective. Most of the chemicals now in use are toxic to man and animals and this is another drawback. They are disagreeable to handle and difficult to apply. While most of them are believed harmless to the soil, there is a need for more research on this problem. The same applies to the effect of crops grown on fumigated ground, then fed to animals or humans. So far they have shown no undesirable results, and the feeling is that they won't. Soil fumigation, because of these points, is still in its infancy. At present soil fumigation must be practiced with considerable caution. The thinking of the men working on the problems of soil fumigation was well phrased by B. G. Chitwood, formerly of the U. S. Bureau of Plant Industry at Beltsville, when he said "We feel that the day is not too distant when soil fumigation will be as regular a procedure as spraying or dusting."



THE ROOT on the right is healthy, while its companion bears nematode damage.

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THE TALE OF A CALF

(Continued from page 49)

sible for the low loss from shipping fever: (1) buying directly from the ranches; and (2) treatment on arrival.

Shipping fever in cattle is a respiratory disease like flu in people; anything that excites the animal or lowers his resistance makes him more susceptible to fever. When cattle are purchased directly from the ranch they can be given quiet handling and quick delivery. Cattle which come through the city stockyards have often changed hands from three to ten times. This means that they have been kicked and cuffed a lot, as well as having been exposed to all the diseases of the central yards. They have been on the road for so long they have become stale. These calves, just taken from the cow, are babies; the separation itself is a shock; mishandling only makes the shock worse.

When the calves arrive at their destination after a quick trip, they are put in an isolated lot with plenty of water, a moderate feed, and as much quiet as can be secured for the first five days. This gives them a chance to throw off any sniffles or fever that has started and to get used to their new surroundings.

Experience has shown a few practices to be bad. These don'ts are: (1) Don't put the calves in a closed barn or a drafty barn. Closing calves in a barn or even placing sick calves in a barn has caused beginners to lose more animals than all other causes combined. (2) Don't vaccinate. Vaccination comes too late at this point and only adds to your trouble. It will pay to call your veterinarian the day after the calves arrive to take temperatures of any calves which look out of condition. The better informed veterinarians are using sulfa drugs and penicillin to treat shipping fever and seldom lose a calf.

Bloat

Loss from bloat can generally be traced to bad management somewhere along the line. It is most frequently caused by an improper pasture mixture, perhaps too great a percentage of legumes and not enough true grasses like brome grass, fescue or timothy. This danger can be overcome to a great extent by seeding rye in late September or early October in the fields to be pastured the next spring. The seeding can be done with a wheat drill.

A second management failure that results in bloat is in preliminary feeding. To minimize the possibility of loss from this cause, cattle should be well filled with hay or silage before they go to grass in the spring. Once on pasture they should, if possible, be left on continuously; otherwise precautions should be taken each time they are put on pasture again. If rotation grazing is practiced, the grass should not be cropped too close, or the new field may cause bloat.

There is certainly more danger of bloat with lush super pastures than with ordi-

nary bluegrass pasture. The greater danger, however, is offset by the difference in gain between cattle grown on the two pastures. On bluegrass pasture, a gain of one pound a day from May to August would be good. On super pasture the gain should be two to two and a half pounds a day. The difference between pasturing 100 steers on bluegrass and on super pasture would be 10,000 pounds of beef. Bloat losses would have to be staggering before this margin was erased.

When the grass feeding program was started most of the feeders insured their animals for loss from any cause from October until August. This covered loss from shipping fever and bloat. Now most of them insure only for the first month because their later losses were so low. Insurance, of course, will only cover the actual loss and not the profit that was expected from raising the animal.

The gamble in feeding heavy cattle, as was stated before, is that the price per pound must increase if the feeder is to make a profit. This risk has been eliminated in feeding on grass. The loss from shipping fever, bloat or any other cause that a feeder can sustain without folding is hard to estimate, but old hands claim that if the price holds firm they can lose up to one-third of their animals and still get their money out if the loss occurs before they start feeding corn. If it occurs after the animals have put away several bushels of corn they can not stand so great a loss.

A Part of a Whole

"Turning grass into beef at a profit is only part of the grass program," Henderson says. "The rest of the program is the general improvement of the farm by greater care of the soil. When I started in on this program I operated this place with four hired men. Since then I have cut my corn land in half and increased the yield from 65 bushels to the acre to the point where I'm disappointed if I don't make a 100. At the same time I've doubled the number of cattle I feed, increased the number of hogs raised to four times what it was, and cut the labor force by two men. Improving the pastures and grass feeding steers are a part, and a vitally important part, of this whole program."

Spotty the Calf, whose brief life lasted but 19 months, ended his career in the slaughter house as beef cattle must. His life story is not a long one, but today as acreage allotments are being proclaimed on corn and wheat land and as more farmers are realizing the economic importance of grass farming, the story of Spotty and his brothers is of prime significance.

THE AUTHOR: C. M. Long has been farming, teaching agriculture, or managing farms since 1887 when he began working on his father's farm near Columbia, Missouri. He was the third man in the United States and the first in Missouri to be appointed a couny agent. During the past 10 years he has given management advice on approximately 100,000 acres through his Farm Clinic in Lafayette, Indiana. As he puts it, "If Methuselah had farmed 160 acres all of his life, he'd have about the same experience I have had."

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HYBRID CORN "runs out"; it does not breed true, but it is not a fixed variety.

DO CROPS RUN OUT

BY ELTON L. JOHNSON

THE science and practice of plant breeding has proven that a pure line of a self-pollinated crop variety will continue to breed as long as it is not mixed or crossed with other varieties. Yet the myth of "running out" persists among many farm people. The speed with which new crop varieties have replaced the old in recent years has seemed to support this old and commonly accepted belief.

Some farmers still belive that home-grown seed is not as good as seed from some other part of the country: they expect the superior qualities of Clinton oats, Hawkeye soybeans, or of other improved varieties of self-pollinated crops to break down after a few years of replanting in their fields.

This notion, which is little more than a superstition, has a firm hold on some farmers. It is common practice for the housewife to exchange flowers and vegetable seeds of the same varieties with her neighbors on the theory that the varieties run out in her garden. She explains that her crimson and white hollyhocks have both "gone to pink". This is possible, but the reason is cross-pollination, which is not running out.

There is an irregularity in some varieties of oats, such as Clinton, which is often mistaken for a deterioration of the variety. The running out myth has most often been associated with oats in the past principally because of a tendency of off-type stalks and heads to show up after a few seasons. In some parts of the corn belt seed oats raised in Canada or some distant part of the United States are brought in and sold to farmers in regular cycles of about every five years or so. The imported seed may be all right. But often it is not the variety best suited to growing under local conditions. Chances are that locally produced seed of a recommended variety, properly handled and certified, would be better.

Buying shipped seed is expensive and unnecessary because it is biologically impossible for oats or any other self-pollinated crop to run out in the sense that this term is ordinarily used.

Actually, there are important mechanical differences in the way different crops produce their seed. Oats, wheat, barley, soybeans and flax are self-fertilized—the fertilization process takes place within each flower individually. The amount of crossing with other plants is very small. Red clover, brome grass, and several other

forages are cross-pollinated. In crops like corn, the tassel and ear are separated. Here cross-pollination is the rule, although self-pollination is possible also.

These principles are important to the plant breeders, and they are important to the farmer too. They are the reason why a particular crop variety does not run out.

Corn is an example here. The old open-pollinated varieties were unsatisfactory partly because of the cross-pollination that took place. If you grew two varieties close together, they crossed and your seed produced a great variety of plant types the next year. Just a little seed mixing would cause a good deal of crossing, too.

Hybrid Corn Runs Out

Most farmers know that hybrid corn does not produce well from its own seed. Here is a clear case of a crop that does not breed true—it literally "runs out" after the first year. But hybrid corn is not a "fixed" or true variety. Rather it is an artificial combination of two or more inbred lines which bring together several desirable qualities in the same plant. It cannot breed true, whereas a true variety does breed true.

New crop varieties are developed from crosses between different parent varieties, too. And many people have asked if these, too, might not break up genetically and lose their uniform type after a few years.

This is not the case. It is perfectly true that many of our improved crop varieties result from crosses similar to those made in hybrid corn. But the breeding process does not stop here. Several generations are grown for selection and reselection in order to get a line which breeds true for the desired characteristics. The variety becomes fixed.

By the time a new crop variety is released for general use, it has been thoroughly selected and made uniform. There is no hybrid quality left in the sense that corn may be hybrid. As a result of careful selection through several generations, the new variety is often more pure than the parent stock from which the original crosses were made, for all recessive qualities, which may have been covered up in the parents, are bred out.

In crops that are self-pollinated—where the pollination takes place within each individual flower—there is practically no chance for natural crossing with other varieties. Most of our common grains are in this class. Crops grown under farm conditions should continue to breed true as long as seed is not mixed with other varieties.

Hawkeye soybeans, for instance, have exactly the same genetic quality whether the seed be grow in Iowa, Indiana or any other state.

Looks Only Skin Deep

Sometimes the appearance of the seed is pointed to as evidence of the difference in seed grown in different regions, and it is perfectly true that there may be a difference in the appearance. Weather conditions, storing or damage from disease may affect the outward appearance of seed a great deal. There is sometimes damage to the seed itself. But this has nothing whatever to do with the variety.

It's almost impossible to prevent some mechanical mixing of different varieties in the process of planting, harvesting, cleaning and handling seed. If other varieties get mixed in with a batch of seed, your crops won't look very uniform. It may look as if it is running out. The accidental or careless mixing of seed should not be mistaken for "running out.", even though it may look like it.

When a variety said to be disease resistant is suddenly attacked by a new disease, farmers are likely to say, "It's running out; it's losing its vitality."

This happened in Iowa four years ago when oats that had resisted all known diseases for years suddenly were attacked by helminthosporium blight. The varieties Iowa farmers were growing in 1945—Tama, Boone, etc.—were resistant to most of the important plant disease that were bothering oats at the time.

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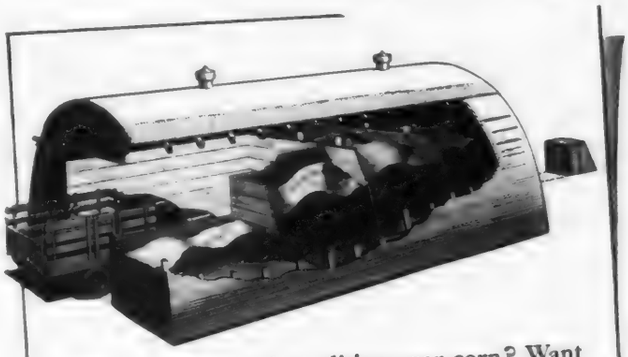

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Until then helminthosporium had been just a minor disease that appeared on some grasses. It didn't seem to cause any trouble.

But the Tama, Boone and other varieties of similar parentage unfortunately were susceptible to helminthosporium blight. And when it blossomed into a serious oat disease, these varieties appeared to lose their vigor and yielding ability.

No Change

These varieties did not run out. They were just as resistant to stem and leaf rust as they had ever been. It was just that a new disease had come on the scene to attack them. That is why Iowa oat growers switched to Clinton, a variety that is resistant to helminthosporium as well as to the other rusts and smuts.

Tama, Boone and other Victoria derived oats were no more resistant to helminthosporium blight when they were released than they are today. But at that time the disease was not important. Only when the disease spread and developed into epidemic proportions did it affect yield, stand, and in other ways give the appearance of running out.

Domestic animals and man are particularly susceptible to new epidemics. The hog cholera epidemics, for instance, and the flu epidemics of World War I, were serious. But the hogs have not run out, and neither has the human race, some cynics notwithstanding.

A WHEAT BLOSSOM has both male and female parts. By cross pollinating, new varieties are produced that resist new diseases.

—From Iowa Farm Science, April, 1949.

THE AUTHOR: Elton L. Johnson is research assistant professor of the Poultry Husbandry Section of the Iowa Station, in charge of poultry nutrition. He was born in Colorado, moved to Oklahoma when a little tot and lived there until through college. He graduated from Oklahoma A. & M., then went to Purdue University in 1940 for advanced work. He received his M. S. degree in 1942 at Purdue and shortly after went into the army where he spent nearly 4 years. He came out with the rank of captain. He returned to Purdue after the war and continued on the experiment station staff and obtained his Ph.D. degree. Dr. Johnson joined the Iowa State staff in February, 1948.

JOHNNY APPLESEED

(Continued from page 81)

rived to establish their claims. Here in the Brokenstraw country, people would be coming in a steady stream all through the next ten years, and the story is that Chapmans' apple seedlings started all of their first orchards.

The next year, he turned up fifty miles down the Allegheny in the neighborhood of Franklin. Local stories there say that he not only planted seeds but tried to establish a land claim. He failed in the latter effort partly because his main interest was in nurserying, and partly, perhaps mainly, because there was something in John Chapman that could never be tied to any particular plot of ground.

By 1800, he had been a hundred miles farther southwest over the Ohio River inside the Northwest Territory. It was Indian border country, only five years removed from the Treaty of Greenville following General "Mad Anthony" Wayne's victory over the Indians at Fallen Timbers, and still much too trigger-touchy for comfortable pioneering. But Chapman must have been there early, for first comers to Carroll County, Ohio, about 1800, found a plot of young appletrees waiting for them along Indian Run.

By the next year, he was down the Ohio River in what would become Jefferson County, and the same year seventy-five miles on west along the general line of Zane's famous trace into the very heart of the new country on the Licking branch of the Muskingum River.

Then three years later he was planting twenty-five miles farther north along Owl Creek, where the city of Mount Vernon stands today.

In 1804, there is evidence to suggest that within the same twelve months, the far-roving nurseryman actually made visits both to the banks of Owl Creek in north-central Ohio and to those of the Allegheny 175 miles away. This span of travels, probably traversed twice, with various nursery plantings scattered in varying stages of growth along the way, sets the pattern for the extraordinary business that had been developing. And it really characterizes all the rest of John Chapman's career, except for the fact that the terminals of the annual itinerary would gradually shift westward so that forty years later, the east end would be resting in central Ohio, and the west in northern Indiana.

Big Business in Seedlings

People have thought it queer that Chapman should have been building a business out of *seedling* appletrees. Nobody plants orchards of seedling trees today. Appleseeds, most people know, never feel any obligation to produce fruit that is true to type. So complicated has been the business of cross-pollination through countless generations of ancestral appleblossoms that the laws of genetic chance make any faithful reproduction of a parent apple well-nigh a miracle. In fact, as any

schoolboy knows who has nibbled the wild apples along country fence rows, such native fruit is almost always a long throwback toward primitiveness. The seeds from a delicious MacIntosh or Baldwin may bring nothing but insipid, greenish fruit with leathery texture and inferior size. Our name varieties today must be multiplied for the nursery markets, not by seeds, but by grafts or buds set carefully into growing root-stock, before a nurseryman can sell them under guarantee.

Apple offspring were no whit less wild in 1800. Consequently, it has seemed strange indeed that John Chapman should have gone roaming into the trans-Appalachian wilderness planting appleseeds for anybody's use, let alone to put money into his pocketbook. Yet it is a fact that the great part of the pioneer orchards across much of the Middle West were planted with seedling trees. The reason? Simple. There was rarely any other nursery stock available and the settlers had to have apples of some kind just as soon as possible.

That urgent need of the pioneer for apples is something else another century can easily overlook. Apples have been relegated in normal diets today chiefly to side dishes and casual eating, and the family orchard has wholly disappeared from many a farm. It is hard to realize that in the history of most communities the first apple crop once marked something of a first stage of permanency.

Apples meant not just fruit in season; they were one of the few crops that remained basic through the year. They could be dried and butters or jellies made from them that could be kept through long periods of time in an age when the simplest of modern canning techniques were not only still unavailable but undreamed of. Even more vital was the cider production. Cider each fall meant not merely a pleasant beverage of increasing strength but those two invaluable by-products fundamental to every housewife's food program—boiled cider and vinegar. Without them her whole preserving,

Appleseed Is Chosen For Highway Name

Athens, Ohio, March 30—(AP)—A route between the Ohio River and Lake Erie will become the "Johnny Appleseed Highway."

Mrs. Thomas Wolfe, Athens, President of the Ohio Association of Garden Clubs, announced today approval of the name by the State Highway Department.

The highway will include portions of U. S. 33, Ohio 31 and U. S. 25 and honor an early Ohioan who roamed the state planting apple trees.

Mrs. Wolfe said the association would plant pine, crabapple and other trees along the route.

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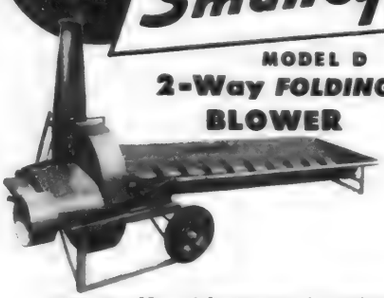

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THE LAST HAUNTS of Johnny Appleseed. A pioneer settlement in northeastern Ohio in 1846.

pickling, cooking, and baking routine remained not merely primitive, but almost impossible.

Cider had a further important role in the economic development of the West. Apple brandy, the ultimate distillation of the fermenting juice, would in time flow in sufficient quantities from the first presses and stills of the Ohio valley that it would be among the first exports of considerable bulk to reach New Orleans after the Mississippi shipping route became American in 1803.

Almost any apple would squeeze out juice for cider, or cook down into applebutter, or feed livestock. Grafted trees with guaranteed names were unavailable anyhow to most newcomers over the mountains. The average migrant to the West had neither the packing space to bring such bulky treasures over the many-weeks-long trails, nor the ready cash to have them imported once he had chopped out a place for himself in the wilderness.

Here is where John Chapman stepped into frontier logic with his apple seedlings. As soon as the hundreds of little trees he sold to the men making the first clearings had started growing, they would be grafted with slips from the nearest available good trees, often with scions sent from the East. The important thing was to get the trees established. Many of them would never produce anything but coarse, wild fruit, but even that would have some use, and once in a while among the native seedlings there might even appear by the chance of variation and heredity, some new superior fruit, perhaps a Stark or a Grimes Golden that would prove even better adapted to the south slopes of this new country than any of the importations from the seaboard.

John Chapman's market was ready-made, therefore, by a peculiar combination of geography and history, and he was by no means the only nurseryman from the East who rushed in to profit from it. Even while Chapman was making some of his first trips down the Ohio in 1801, for instance, there were already commercial nurseries growing at Wheeling, at Marietta, and at other early settlements down the Ohio River.

It was not John Chapman's business of sowing appleseeds, then, that was queer, as story tellers sometimes suggest, but the peculiar quirk of management he gave it. Most men, whatever their trade, prefer to settle down ultimately in a stable home in some particular neighborhood. Nurserying however, could not settle down in 1800. It was too specialized a business. Its local market in the first wave of development was soon exhausted, except in a few thickly populated centers. Any one expecting to make a living by selling cheap apple seedlings to first settlers, therefore, had to keep up with the settlers or else stay behind and be absorbed into other business and the next stage of community economy. Most of the appleseed planters were soon absorbed. Not John Chapman, and the fact immediately set him apart as out of the ordinary. People wondered.

They still do, although we know a great deal more now of his personal history than most of the cabin dwellers who saw him along the trails. He had been born on September 26, 1774, in the New England rural town of Leominster, Massachusetts. His family had come on both sides from vigorous Yankee blood for several generations. His father, in fact, had been one of the "Minute Men" at Lexington and Concord, had fought at Bunker Hill, and when John was left motherless at the age of two, had been with Washington in New York and would be later at Valley Forge. John had probably grown up in Leominster, or perhaps in later boyhood near Springfield. But what else had happened to him during the years before he appeared west of the mountains in his early twenties as a full-fledged appletree producer is still any one's guess.

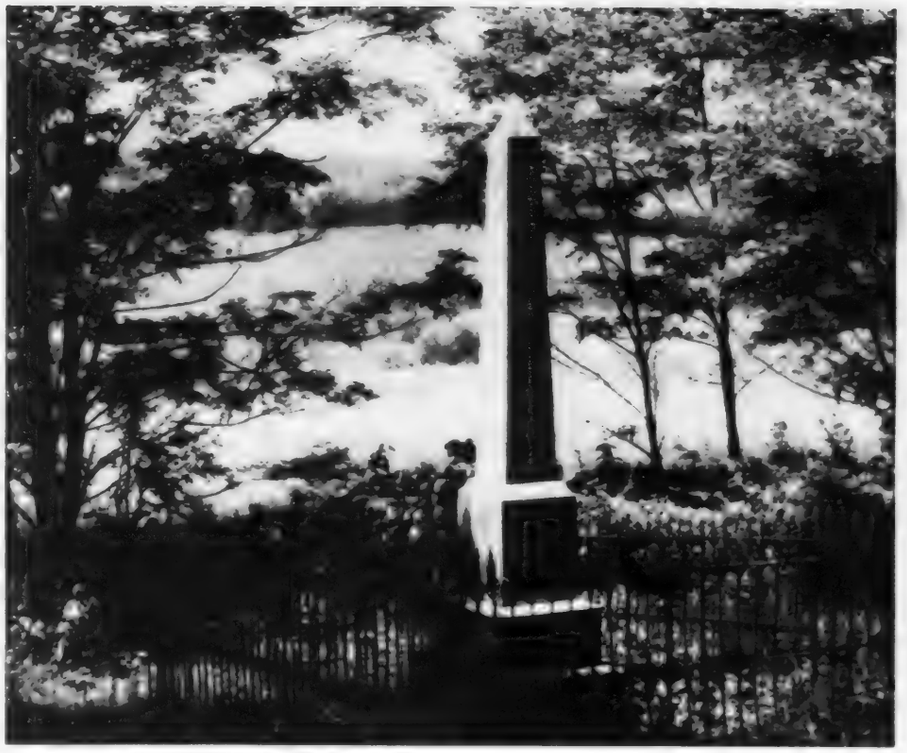
Colorful guessing, in fact, is exactly what John had the knack of inspiring from the very first, wherever he went in the West. People along the Allegheny heard that he had wrestled with snowstorms on the Ap-

palachian plateau, and had once floated down the river asleep on a chunk of ice. There was no hardship he had not endured or emergency he could not face. By the time he was planting in central Ohio at the age of thirty, it would have been possible to trail his journeys, not only by his plantings but by the yarns he had left behind, for many of them would still be lingering from the Allegheny to the Mohican fifty years later.

The real legend, however, as we know it today, was just about to begin. North-central Ohio was to become the true Johnny Appleseed country.

Venture in Real Estate

By the time John reached the Licking and Owl Creek valleys just after 1800, he seems to have been interested in acquiring new, cheap land for himself so that he could settle down and live normally in a stable community. He bought two town lots in the newly platted village of Mount Vernon. And in the next few years he was involved with a long succession of purchases and leases in various parts of northern Ohio. There is evidence that he made clearings with the intent of establishing a home. He is even said to have proposed marriage on several occasions. In all, he spent about twenty-five years in the north Ohio counties now marked by such cities as Newark, Mount Vernon, Mansfield, Ashland, and Wooster — a longer period than he was ever to spend in any other well-defined area.



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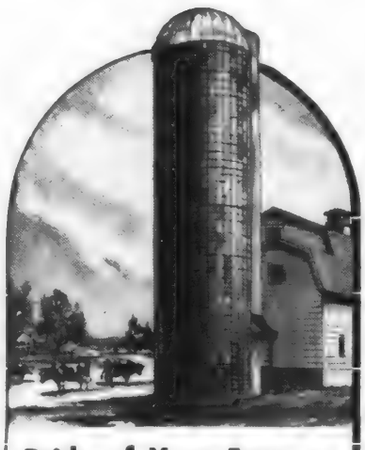

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Whatever his other projects, however, he never abondoned his nurserying, and at the end of the quarter century, when his little seed patches at various times had gradually spread into a network over at least nine counties, he was still just the itinerant appletree man of the trails, with no home or any other adjunct of normal middle age.

But a miracle had happened — John Chapman, the Yankee nurseryman, had become Johnny Appleseed. And in spite of all his strangeness and abnormalities, he had won a huge place in people's love and fancies. Only a few people in many generations are ever so fortunate.

First there had been his colorful strangeness. There was no doubt about it, he was just queer, as the common run of people went. Although these Ohio settlements had grown up rapidly into progressive modern communities, John had remained always the borderer. He dressed like one. He lived like one. He preferred campfires and improvised shacks in the woods to firesides and modern houses. People talked, of course. They treasured anecdotes about his eccentricities, and as always happens they created more. Somebody had seen, or imagined he'd seen, for instance, John with a mushpot on his head, and the story spread that the pot was his standard headgear—it still is, in the folktales.

Then there was his religion. Somewhere, he had touched the beautiful idealism of Emanuel Swedenborg, had become an ardent convert, and was to spend the rest of his life more or less as a voluntary missionary in this faith. He distributed literature and talked the mystical doctrines to the frontiersmen. Few understood the subtle reasonings about material-spiritual correspondences, but they could understand the great humanitarianism exemplified in the life of kindly John Chapman. Consequently, Johnny's appletree business was soon all mixed up in people's minds with his angels and with a host of quaint tales about his goodness to all of God's creatures, even the lowliest. He ever put out his campfires, they said, when mosquitoes were perishing. And one day near Perrysville, after having killed a rattlesnake that had bit him, he was shaken with deep remorse for having taken the life of one of God's beings that had merely used its best wisdom in self-defense.

Even more cherished were his kindnesses to people. When 17-year-old David Hunter near Mansfield lost both father and mother and was left not only with a farm to manage but with eight younger brothers and sisters to rear, John gave him enough appletrees to set out a large orchard. It became one of the finest in the county. When a family near Spring Mill lost all their china in an accident, John stopped in at Sturgis's store in Mansfield and bought them a new set. Newcomers making their first clearings commonly found John at their doors, not only to advertise his nursery line but to bring

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It was the War of 1812, though, that really touched off the heroic part of the gathering legend.

When the fighting with Britain broke out in the summer of 1812, the Indian border in northern Ohio had immediately become angry and dangerous. Chapman, who was freer than most men, promptly became a border scout and seemingly, on several occasions, did the settlements good service in warning of possible dangers. The climax came in August when the Indians began a series of terrible slayings in the valley of the Black Fork. On one especially fearful night, John, it was said, ran barefooted the entire dangerous thirty miles from the unprotected blockhouse in Mansfield to summon soldiers from Mount Vernon. He became the community hero after that, and seventy-five years later when the citizens of Ashland County set up a memorial to the people massacred in 1812, they inscribed his name on the stone—the first of numerous Johnny Appleseed monuments today.

The Pioneer Ideal

So, his appletrees, his kindly Christian idealism, his heorism, and downright queerness had combined to make a community folk character of Johnny Appleseed. People liked to think of him and his seeds as having been put into the American West for a divine purpose. They often referred to him as a sort of John the Baptist who had been sent to prepare the way in the Western wilderness for the advance of American democracy.

About 1830, people began to see less of John in central Ohio. His nurseries had been slowly extending west into Indiana. By the time the first earth was turned at Fort Wayne in 1832 for the new Wabash and Erie Canal, he was already making his western headquarters in the St. Joseph's—St. Mary's—Wabash region. It was new country for him again, just about to feel its first big rush of development, the sort of place where John Chapman had always felt most at home. Instead of traveling back to Pennsylvania each fall as he had once done to wash out his supplies of appleseeds at the cider presses, he had only to return to the communities he had helped found a quarter of a century before in central Ohio.

During the last few years of his life his older haunts saw him chiefly on his annual round of visits , which he seemingly maintained till the year of his death. Much of the cherished picture of the saintly gray-haired old man that has become firmly fixed in the popular story came from these last visits to Ohio.

When he died at the age of 70 one cold day in March, 1845, in a cabin north of Fort Wayne, he was still an active nurseryman. Since 1834 he had been investing his life's savings in canal lands and had finally acquired approximately 274 acres in Jay and Allen counties, Indiana. On

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Every morning, at nine, the editors assemble and go over their own farm problems. (To become an editor of FARM QUARTERLY, you must own a farm and work it.) Out of a morning's conference a story idea usually develops. Let's say the discussion this morning is about beets. Each editor gives forth his own prejudices, ideas, and convictions on beets, plus the things he wishes he knew about beets, but doesn't. An outline is prepared on "Growing Red Beets". Telephone calls are put through to the nation's outstanding authorities on growing beets. One individual is selected to write an article on beets. He is sent the editors' outline and asked to revise and improve it. Once his outline is OK'D, he is told to go ahead. After the article is finished, one editor takes it into the field showing it to men who raise beets successfully, to men who make fertilizers for beets, to farmers who grow beet seed, to manufacturers who make special beet equipment, and to men who can beets and buy them from large growers. The editors also visit farmers who have failed with beets and who never want to see them again, as well as county agents in spots where red beets are the cash specialty.

By now the article has many changes, corrections and amplifications. The revisions are sent back to the expert for his approval. Then it is set in type and a galley proof mailed to perhaps twenty men who work with beets as growers. They offer more criticisms, and corrections. The editor-in-chief of FARM QUARTERLY selects which of these suggestions he will use and also writes out a shooting script for Joe Munroe, our staff photographer.

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at least two of his tracts, his estate papers show, he had appletree crops in production. One in Jay county had 2,000 trees worth inventorying at two cents each; one in Allen county had 15,000 more worth three cents each. The rates were problably not far from the sale price he had been charging for the past half century. In addition, he still owned small plantings in Ohio.

It is hard to estimate Johnny Appleseed's precise horticultural service to the Middle West. His activities had served in an unique way a huge segment of territory extending deep into new country. There is nothing like it anywhere else in the American story.

THE MANSFIELD BLOCKHOUSE Johnny knew in 1812 when he traveled central Ohio.

But he had left behind far more than appletrees. Even before the John Chapman of the flesh had passed on, the spiritual Johnny Appleseed had started an even greater sowing and harvest. Probably every last one of John Chapman's tens of thousands of seedling trees has long since grown and now disappeared from view (although local reports of their continuance may be heard all the way from Massachusetts to Illinois), but the planting of Johnny Appleseed—his lesson that the soil is to be used primarily for human service—has grown into a chain-planting of practical idealism that links the Atlantic to the Pacific. Johnny Appleseed today is not merely the patron saint of all American orcharding, but of planting and conservation and natural beautification wherever these services are in progress. He tends national forests, builds conservancy dams, beautifies roadsides, and tucks flowerseeds into school gardens. He alone of all America's great legendary folk heroes now is primarily concerned with the extension of beauty and fruitfulness, with everything that leads forward the American ideal through wise management of natural resources.

THE AUTHOR: Dr. Robert Price is professor of language and literature at Otterbein College, Westerville, Ohio. Though he was born in Wales, he was reared in Ohio. When Farm Quarterly began research on Johnny Appleseed the editors were told, "Dr. Price knows more about Johnny Appleseed than any one else in the world." His articles on Middle Western literature, local history, and folklore have appeared in *Country Gentleman, Scribner's, New England Quarterly, Country Home, American Literature*, historical journals of Ohio, Indiana, Michigan, and Illinois and a variety of other periodicals.

INSIDE A DUST STORM

(Continued from page 79)

grass because it can't be farmed safely with any other crop. But they agree that for the most part their warnings will probably go unheeded.

Soil scientists have outlined three major factors within the soil which influence wind erosion. They say soil texture, soil structure, and lime play important roles. Soil texture is determined by the relative amounts of sand, silt, and clay particles. Soil structure is the aggregation of soil particles, or clumping of the soil, which in turn is determined by organic matter, soil structure and lime. Lime plays an important part by stimulating the granulation of soil, for soils of more even sizes won't break down as readily as those having a wide range in size. What part in the whole wind erosion picture each of these play is one angle of the laboratory investigation.

Wind Erosion in the Midwest

Outside the Great Plains small areas suffer from blowing soil in several Midwestern states. Jerry Paschall, of the Regional Office of the Soil Conservation Service, in Milwaukee, reports that wind erosion is serious locally in parts of Wisconsin, Michigan, Minnesota, and Illinois. The most serious erosion occurs in the sandy fruit belt of Michigan.

For both the sandy soils and the mucklands, farmers have been using two common protective practices. One is a system of strip cropping in which the farmer plants one or two drill widths of rye followed by three or four widths of his cash row crops. The tall growing rye breaks the force of the wind. Another practice is to plant willow windbreaks along creeks, drainage ditches, and field borders.

A few years ago in west Ottowa County, Michigan, farmers were faced with the fact that the drifting sands had made the land worthless for row crops. Farmers planted beach grass to hold it down until evergreen windbreaks could get a start. Within a few years part of the evergreens was sold for Christmas trees. Other trees were planted to replace the harvested ones and the land, once controlled by the wind, is now producing an annual cash crop.

Outside the Great Plains the wind erosion problem is not generally serious or one which requires much work or worry on the part of the farmer. There is even some belief among wind erosion specialists that a soil cement can be devised which, when spread on a field, will glue the top soil in place. The use of soil cements is being given limited trial runs in a few localities. The Shell Oil Company is working on a cement for use on highway embankments, but the product has not reached the commercial stage.

Zingg and Chepil are investigating the possibilities of three cementing materials, asphalt, alkyl and phenolic resins, and agricultural organic materials such as wheat straw. These substances must be spread over the fields in a liquid state, and until some method of emulsifying them in water can be worked out there is little hope of using soil cements widely. Eventually soil cements may be refined so that they can be sprayed on a newly planted field with ordinary farm equipment.

The Growing Dust Bowl

The Dust Bowl is growing. It is moving west beyond the tall grass plains. The newest danger zone is along the western edge of Texas, Oklahoma, Kansas, and Nebraska, where the soil is less fertile, sandier, and drier than it is to the east. The Dust Bowl has spread because the war brought an added need for food production and the land which should have been left in grass was turned with plows and pulverized by cultivators.

Soil conservationists have experienced some success in getting Great Plains' farmers to follow prescribed practices of fighting wind erosion. Many of them are excellent farmers and wherever he works the excellent farmer takes care of his land. But much of the Great Plains is the domain of the suitcase farmer who comes for a season or two, takes what he can get, then pulls out, leaving denuded fields as his trademark.

Wind is elusive, invisible, and one might say a difficult thing to get one's

THIS wind tunnel is hauled on a trailer.

teeth into. Understanding all its eccentricities will take time, and the scientists at the High Plains Wind Erosion Laboratory are prepared to spend the time for the stakes are high. These scientists, as well as the farmers on the nearby plains, are impressed with the seriousness of the problem several times a year when high winds whip across the flat lands and threaten to take the top soil for a one way trip.

While the scientists work to solve the wind erosion problem, the western farmer looks often at the horizon during the day's work. At night he sometimes lies awake listening to the wind go 'round the house and on across the prairie, and wondering how much of his top soil it is taking along.

FIELDS IN THE CLOUDS

(Continued from page 29)

just at noon, maybe at sundown, but just as likely at some other hour of the day. Always there must be *tostado* ready to eat—dry corn toasted slowly on a flat clay plate over the little fire of corn stalks. And always there must be a bowl of something in the kitchen corner, for the Indian housewife likes to be prepared whenever someone in her family is hungry or some neighbor stops by to chat. Most frequently this will be some form of *mazamorra*, the thick corn soup that is the main dish of the Otavalos.

As the afternoon wanes María Maldonado leaves the others working in the dooryard and enters the dark windowless room of their little house. Arranging a handful of cornstalks and twigs between the three hearthstones, she blows up a fire from the embers that are never allowed to die. As the fire catches she sets on it the clay pot half full of water. Now she climbs to the storage platform and gathers several ears of dry corn. These she shells and grinds to a coarse flour on the millstone. She stirs the meal into the boiling water and as it cooks adds cut-up potatoes and cabbage and onions and a little salt and lard. From day to day the *mazamorra* varies. It is made with green corn and with the various beans in their seasons. On Sundays it may be sweetened

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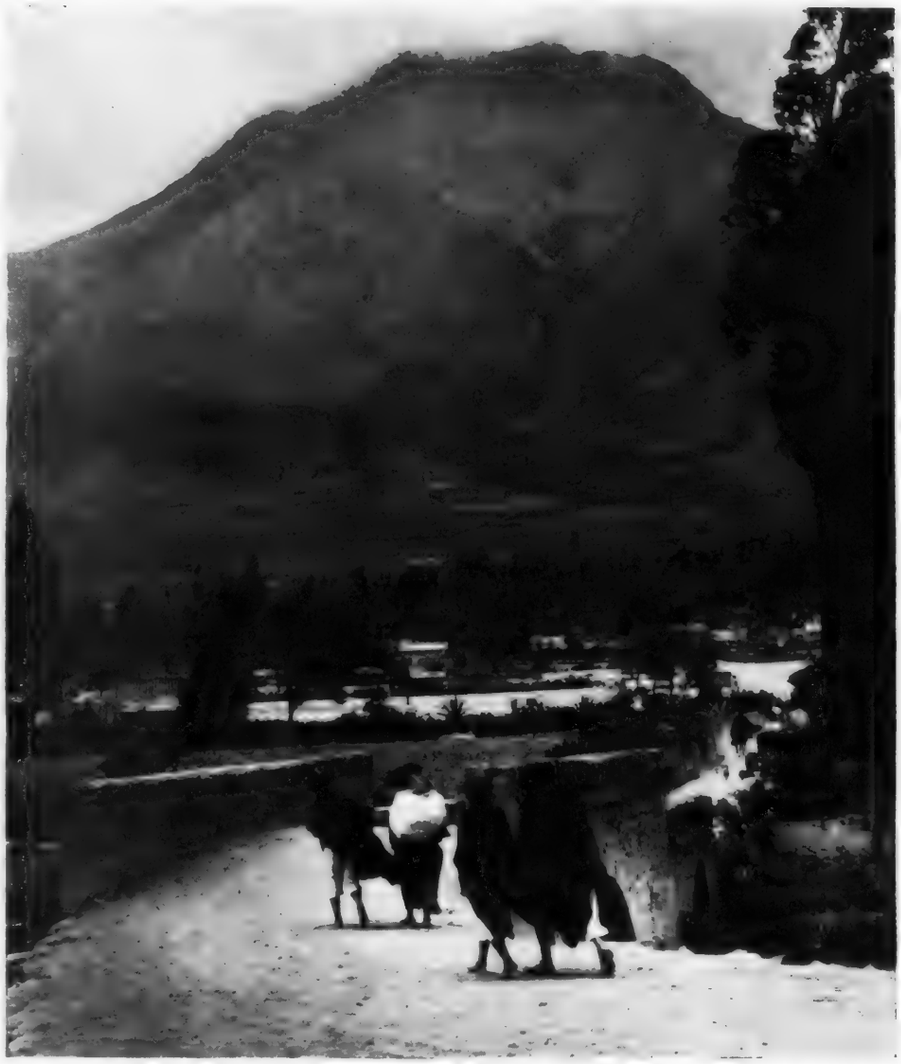

RETURNING FROM THE MARKET, these Indians arrive at their village at the foot of Mount Imbabura. Their fields climb the slopes as far as crops can be grown.

like a pudding. Sometimes meat is added —pork for fiestas, guinea pigs for special occasions like weddings. *Quinoa,* and barley, and whole wheat are also used for soups. And little hard rolls of whole wheat bread are a favorite with the Indians, though the white people of the town look down on anything but white bread.

The setting sun is golden on the peak of Mount Imbabura. The Indians' day is at last done. María Maldonado sets out the evening meal on the packed earth floor before the hearth. She kneels over the embers, her slender arms reaching forth from her white blouse as she stirs the earth cooking pot, and ladles out generous helpings of the hearty soup.

Around the glow of the corn stalk fire the evening meal is eaten. There is hardly a word spoken, only the satisfying sound of chewing and supping. One after another the bowls are emptied, refilled, and emptied again, and the basket of *tostado* passed from hand to hand. At last everyone reclines on the ground under the open porch of the house, watching the last light of day turn from pink to cool green. The chill of the Andes settles on the valley. Warm ponchos are pulled on. The tiny chimneyless coal oil lamp is lit, and in its wavering light Miguel Maldonado picks up the carding combs where his son left off.

Cloth and Land

"Where does all our cloth go, father?" queries Manuel, watching the quick sure strokes of the carding combs.

"Ha! Far away, far beyond the mountains!" exclaims Miguel Maldonado with a wide sweep of his arm. "To the tailors in Quito and Rio Bamba. And maybe farther, to the cities of the north. To far away Caracas, they say. Who knows how far our cloth travels?"

The textiles of Otavalos are sold far and wide. Soft shawls for the women, warm and heavy ponchos for the men, wool suiting, cotton cloth. Every Saturday in the dawn trucks are loaded with bolts and bolts of cloth for Quito. Traders, whites and Indians, come from miles away to trade and barter for cloth. Indians of Otavalo leave by bus for Colombia and even Venezuela, a thousand miles north, to sell their cloth. In their neat

white pantaloons, sandles, embroidered white shirts, and dark blue ponchos they walk the streets of distant cities, selling their cloth, earning the cash that will buy another piece of land. Over the months and years the money is saved, till they know a piece of land is for sale. With patience and uncanny insight, they will watch the affairs of a Spanish hacienda owner. Somehow they know when he has lost heavily in business or at the card table. And then the Indians arrive with their sacks of money. Six or seven Indians or a whole community will pool their savings and pile it on the Spaniard's table till he no longer can resist and sells still another section of his valley land. So it

THE FATHER CARDS THE WOOL in the evening as his son plays on the pan's pipes. The evening air is chilly and ponchos are worn.

goes, year after year, the Indians of Otavalo are slowly buying back with cash the land the Spaniards took from them by the sword.

Pedro lifts from the wall a pan-pipe flute of yellow reed. Softly he blows. Rosita claps her hands with delight as a sad melody ripples from the pipes—sad, haunting, but also very peaceful, like the winds at evening, or the mourning doves calling by the lake.

Miguel Maldonado continues his carding. Land, fine valley land! Each brush of the combs brings this vision near. A hundred to a hundred fifty *sucres* for eight *varas* of suiting. But it is not the hoarded cash he dreams of, but the moist loam earth turning under his Indian plow. His head bends lower. A peaceful smile plays on his lips.

THE AUTHOR: John Collier Jr. lives in Taos, New Mexico, when he and his wife Mary, who collaborates with him on much of his work, are not out in the field taking pictures or doing research. This is Collier's second article for *The Farm Quarterly*, the first, which he did in collaboration with Mary, was *The Navajo Farmer* in the Autumn 1948 issue. The present article is the result of two years work in South America where the Colliers did a photographic survey of Colombia and a study of the Otavalo Indians of Eucador. Collier, with Anibal Buitron, is the author of *The Awakening Valley* published by the University of Chicago Press.

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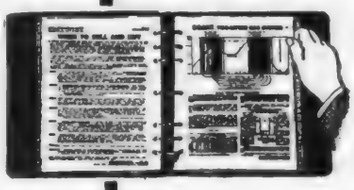

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THE RIGHTFUL HEIR

(Continued from page 57)

rassing family difficulties in settling the estate.

Even if the children have been treated equally, falling farm incomes may make a transfer at present market prices unsatisfactory. The reason is that a falling farm income would have made it difficult for Jim to pay the fixed interest and principal charges on a mortgage for 75 per cent of the present market value of the farm. As land prices fall more slowly than farm incomes this situation may continue for ten years or more.

Protecting the Widow

In death, as in life, a man's first obligation is the protection of his wife. If Roberts had made a conditional will requiring his son to pay for the farm, his wife, if she had survived him, would have been protected because Jim would have paid her for the farm.

This plan should have given the widow greater security in her old age since she could then have drawn upon their lifetime savings which were, as they are with most farmers, invested in the land. She would not have been dependent upon the rent alone. All the children would have inherited from the mother that which she did not need during her old age.

Such a plan has the added advantage that it would be possible for the son to get ownership of the farm about six years earlier. The reason is that on the average wives are three years younger than their husbands and have a life expectancy that is three years longer. Since Jim's mother died before his father this would not have affected him, but in many cases such an arrangement would have transferred the farm to the son at a much earlier age.

Sometimes the father gives the mother a life estate or "life lease" in the farm. This was done in a South Dakota will which read:

> After my death, my wife . . . if then living is to draw the going rent from all the above described personal and real property whether rented to relatives or others. This rent my wife is to draw as long as she is alive . . . out of the rent my wife is to pay all taxes on this land and property as long as she is alive.

Such a life interest provides the widow with some security but she cannot easily sell or mortgage the farm in case the rent is insufficient for her needs. Another dis-

PROMISED LAND HAS NO VALUE if the father does not provide for a legal transfer.

advantage is that ownership by the son is often delayed for many years. In the meantime the son may operate the farm as an insecure year to year tenant, afraid to make needed improvements for fear the mother might rent the land to someone else who would get the benefits of the improvements that the son has made.

Quite often a man and his wife hold ownership of the land as joint tenants or "tenants by the entereties." This means that the widow will have sole ownership of the farm when her husband dies. She may rent, mortgage, or sell the property as she pleases. While this has advantages, it may have its disadvantages. The Carsons are an example.

The Carson brothers of Michigan rented the home farm from their mother for eighteen years after their father died. During this time the mother mortgaged the farm to such an extent that the mortgage was more than the place was worth when the sons finally inherited it from their mother. While the mother should be free to mortgage or sell the farm, if necessary, it was unfortunate that the farm was not sold to the sons by the mother.

In another case the youngest son was 59 years of age before he inherited a share in the farm that had been held by the parents with a joint deed. The mother lived to be 82 years old.

Under such circumstances it would seem wise for the mother to sell the farm to her son. The widow, the farm, and the son should benefit by such a sale in most cases. All the children will inherit from the mother whatever she does not need for her living. Such a plan tends to make the mother independent of her children. This is especially true if the net rent is not sufficient for her needs.

If the widow does not plan to sell the farm to a son or son-in-law at once, she should make a conditional will similar to that suggested for the Roberts, or a will like one made by a Kansas mother could be used:

> I further give, devise and bequeath to my son . . . the old home place . . . upon the following conditions: said son shall pay within two years after my death to (six heirs with payments in dollars listed) and in case said son does not accept said farm upon said terms, then the executor shall sell said farm, and authority is hereby given to sell and convey said farm and divide the proceeds among my children above named (in proportion to the amounts designated, to be paid by said son in case he takes the farm) and in such case one-seventh of the net proceeds of the sale of said farm shall go to said son.

Such a will provides insurance that a satisfactory transfer shall be made in case the mother dies before she sells the farm to one of the children. The sale of the farm to the son can be made even though a will has been prepared. Such a sale has

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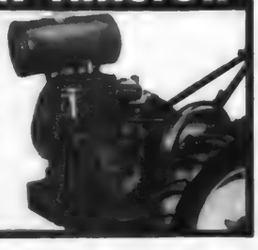

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much to recommend it, as we shall see.

Sell the Farm to the Son

While the conditional will is excellent insurance that a successful transfer of the farm shall be made, it does have a disadvantage. The son is often ready to start farming 15 to 20 years before the parents die.

Sixty years ago families were larger and the life expectancy of parents was shorter. Then the youngest child of the family did not marry until about two years after the father died. Today, with smaller families and longer life expectancies, the youngest child marries 11 years *before* the father dies. This means the *youngest* child would have a family for 11 years before inheriting by a will. The *eldest* child would have an even longer time gap, perhaps 16 years or longer. Sometimes it would be much longer, as was the case in the examples above.

Because of this time gap, farm transfers before the parents death are much more important now than they were sixty years ago.

When the parents retire they can help close the time-gap by selling the farm to a son. Either a land contract or a mortgage arrangement can be used. The choice should depend upon the down payment that the son is able to make.

By such a sale the whole transfer of the farm business from father to son can be kept separate from gifts made before or after death. The transfer is made at the most opportune time, in the judgment of the parent and the son, rather than at the death of one or both of the parents. Death is generally untimely and uncertain.

Another important point is that a sales transfer is simpler than a transfer at death. The details of the sale can be handled by the father and mother in person. With a will only the parents' intentions as interpreted by the court are valid. The consent of the other heirs may be more easily obtained for a sale than for a transfer by will.

When the parents sell the farm to a son they will have access to their savings if they need them during their retirement. Payments made to the parents that were not needed for their living expenses would accumulate as part of their personal property and be available for distribution among the heirs by law or will upon their death. Family agreement may be more readily reached under such circumstances.

Such sales arrangements have been used to good advantage by the farmers of Frankenmuth, Michigan, where a very high degree of ownership is maintained. These farmers are descendants of a shipload of German political refugees who settled here in 1845 — over a hundred years ago.

In this community one son is encouraged to stay at home until he is 25-30 years old and married. Then the parents retire and sell the farm to the son at something less than market price. The selling price of the farm is frequently reduced as much as one thousand dollars for each year that the son stayed home after reaching his eighteenth birthday. Sometimes deeds subject to a life lease by the parents are used.

Other sons have been helped to acquire other farms in the community.

In another county a probate judge is actively promoting father-son transfers by land contracts because he has found them to be far superior to other arrangements for father-son farm transfers.

Second Guessing

Transferring the farm happens only once in a lifetime and, though practice makes perfect, this is one job, like being born, that must be done without rehearsals. The majority of farmers, 86 out of every 100, seem to follow George Roberts' plan —they do nothing about the problem, and their property is distributed by the state according to state law rather than being distributed to the desires of the parent.

With all of the possibilities open to him, what would have been the best plan for George Roberts to have used in passing the farm on to his son? First, Roberts should have made a conditional will which would have permitted Jim to take over the farm provided that he made certain payments to the other heirs. Such a will would have provided for an effective transfer if Roberts had died before he retired and could have put the rest of his plan into operation. Second, Jim should have been compensated for the improvements he made on the farm either in cash or by interest bearing notes so that he would not suffer later for having been a good farmer. Third, when Roberts retired he should have made arrangements to sell the farm to Jim. In this way there would have been no question of ownership or of the continuous operation of the farm when Roberts died. Finally, these arrangements should have been made after talking with the other children and securing, if possible, their agreement to them. If fairly and reasonably done, none of the children would have suffered and all would have benefited from an orderly plan to transfer the farm to the rightful heir.

IMPROVEMENTS come high when bought twice. A note forestalls such unfairness.

THE AUTHOR: Russell L. Berry was born in a sod house on a farm in Saskatchewan, Canada, some 35 years ago and spent much of his early life on farms in Canada and the United States. He was graduated from the University of Illinois and received a Masters Degree from Michigan State College. At the present time he is Assistant Professor of Agricultural Economics at South Dakota State College. Berry is the author of *How to Keep Your Farm in the Family*, a special bulletin published by the Michigan Agricultural Experiment Station.

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VIGO WHEAT

(Continued from page 31)

testing. C.I. 12220 stood out from the others for its many excellent qualities, its resistance to rust and smut, its stiff straw and good kernel size, and abundant yield.

Testing the New Wheat

In 1939 they had reached the stage where they were willing to put it out in test plots in different parts of the state to see how it would respond to different climatic and soil conditions. Farmers throughout the state of Indiana cooperated in running the tests. Men like the late Leo Hirsch of Evansville, Indiana, set aside a plot of ground on farms in the Pocket Area to try out the new wheat. In this way hundreds of yield tests were obtained in competition with many other strains of soft red winter wheat. An average of 30 tests over a period of six years from 1940 to 1946 showed Vigo yielding 37.9 bushels. Trumbull, the heavier yielding of its parents, produced only 31.2 bushels in the same location. The plant breeders had gained transgressive inheritance, the name they give to the case where the offspring outyields its parents.

The many tests had shown the new wheat to be outstanding and it was decided to release the wheat as a new variety. Number C.I. 12220 was given a name, Vigo, named in honor of Francisco Vigo, a pioneering frontiersman of the early nineteenth century. In the fall of 1946, 1800 bushels of pure foundation seed were released in Indiana by Purdue University.

The farmers who were selected to begin the growing of Vigo were chosen by county agricultural agents as excellent producers and cooperators. Twelve of these first growers in the Pocket Area signed a memorandum of understanding with Dean Harry J. Reed of Purdue, and Igleheart Brothers Division, General Foods Corp., in Evansville, to grow the wheat for a complete milling and baking test and also make certified seed available to their neighbors at reasonable prices. Milling tests in June of 1947 proved Vigo to be outstanding for cake flour. That fall, more than 7,000 bushels of Vigo seed were certified in the Pocket Area and sold to highly recommended producers. The eager purchasers, men who had heard of Vigo's yields, were sold the wheat with the understanding that they would certify the crop if possible and make it available to others at a reasonable price.

Vigo Becomes a Champion

The years 1948 and 1949 saw Vigo's reputation established and the spread of this wheat from Indiana to Ohio, Tennessee, Kentucky, Missouri, Pennsylvania, New York, southern Illinois, Ontario, and into the deep south. One factor in building up the reputation of the new wheat was the ten-acre wheat growing contests sponsored by the Southwestern Indiana Wheat Improvement Association.

In 1948 Vigo won seven of the eight top places in the ten-acre wheat improvement contest. In 1949 it made a clean sweep by winning all eight of the eight-county contests with more than 375 fields competing. Also, in 1949, came the big prize. Harold Pirtle became Indiana's Champion Wheat Producer by averaging 57½ bushels of No. 1 Vigo on each of 11 acres. Pirtle, with Vigo, won the distinction of produc-

A MOBILE UNIT cleans and treats the Vigo seed wheat so that it can be certified. Leroy Tade (left) fills bags with wheat that has been treated for covered smut.

THE CHAMPION WHEAT GROWER, Harold Pirtle, and his all time record crop of Vigo.

ing the highest recorded and measured yield of wheat in Indiana.

Stepping into the big leagues, Vigo won first award for soft red winter wheat in 1947 at the Hay and Grain Show in Chicago and repeated the feat in 1948 and 1949. Vigo also won first award at the Indiana Corn Growers' Grain Show at Purdue for all three years it has been in production.

Among individual farmers Vigo became extremely popular and their comments on the wheat sound like the testimonials for a pain killing tonic during prohibition. Typical of these enthusiastic statements is that of Leroy Tade, of Knox County, who said, "Vigo looks like a big step toward better wheat production in this area. It has standing ability, loose smut resistance, and other good qualities. It has outyielded all other wheats."

Most farmers emphasize the fact that Vigo will take heavy fertilizer applications without lodging. Their method of handling this wheat is to seed it with 450 to 500 pounds per acre of 3-12-12 drilled with the wheat. The crop is top-dressed with 20 to 30 pounds of nitrogen (100 to 150 pounds of material containing 20 per cent nitrogen is used) early in March when legumes are seeded. Many of these farmers are seeding and fertilizing early in the spring when the ground is too wet for equipment by dropping the seed and nitrogen from an airplane.

Harold Pirtle, the Champion Wheat Producer, followed this system in raising his outstanding crop. He had followed a rotation of corn, soybeans, wheat, and alfalfa. The alfalfa was seeded into the young wheat in the spring and plowed under as a green manure just before planting the corn the next year. This practice kept up the humus content of the soil and added nitrogen to it; good vertical drainage and liming were two other important factors in improving the soil structure. Pirtle drilled in 400 pounds of 3-12-12

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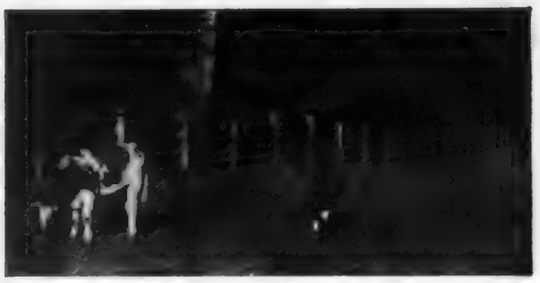

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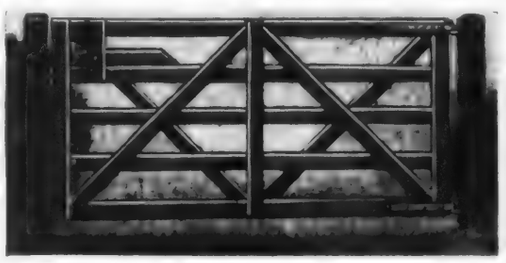

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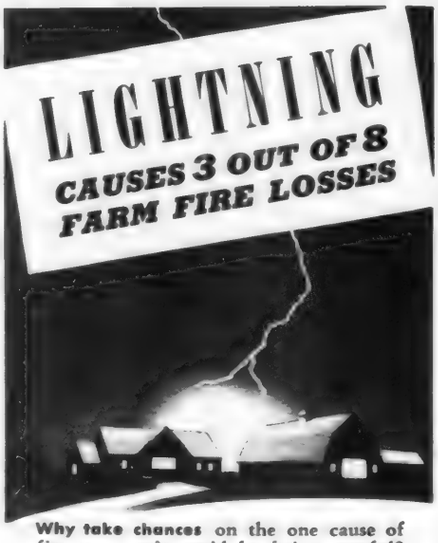

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L. E. COMPTON removes the anthers from a wheat flower before cross pollinating.

to the acre when the wheat was planted in the fall, which was enough fertilizer for both the wheat and the legume. On March 1, he top-dressed the field with pelleted 20 per cent nitrogen at the rate of 100 pounds to the acre. With this kind of soil management, Pirtle was able to disprove the old belief that you can't have both a good wheat crop and a heavy stand of legume. Fertilizing for both crops, he has been able to grow both. When seed, labor fertilizer, fuel, machinery depreciation, and land rental are taken into consideration. Pirtle's profit for each acre was equal to the profit from 55 acres of wheat averaging 17 bushels per acre.

Vigo Isn't Perfect

Vigo was developed and tested in Indiana, but it has spread to other states in the soft red winter wheat region. In Tennessee it has been tested in competition with other older varieties on the Bill Bailey farm outside Clarksville. It is reported that in these tests Vigo doubled the yield of the older varieties. Tested in Kentucky and in the Little Egypt region of southeastern Illinois, Vigo was found to be outstanding in yield. In the fall of 1949 Vigo was being seeded on large acreages in Ohio and Pennsylvania.

Though Vigo is a very good wheat and has a wide area of adaptation, it is not a perfect wheat. Vigo is a little taller than many producers would like and in seasons with continued bad weather there is some shattering. As yet it has maintained its immunity to leaf rust and smut, but there were only 55 races of leaf rust and 10 of loose smut known when Vigo was bred back in 1932— today scientists have identified 130 races of leaf rust and 11 of loose smut. Wheats do not run out, but new races of diseases do develop which make it necessary to develop new varieties with more resistance. Sooner or later one or more of these races of rust or smut may break down the resistance of Vigo.

While Vigo is increasing the yields of wheat growers in the soft red winter wheat belt, Caldwell and Compton, the men who developed Vigo, are hard at work testing some 500 new strains of wheat; eliminating some, holding other strains for further tests, and adding still newer varieties to their test plots. They are searching for the parents that will produce the new wheats of 1960 to 1975.

THE AUTHOR: H. R. Lathrope is Extension Agronomist for Purdue University. In this position he acts as a liaison officer between the research scientists of the University and experiment stations and the farmers. He is a graduate of the University of Wisconsin. Before going to Purdue, Lathrope served as a county agent and teacher in Wisconsin. Since 1946 he has devoted much of his time to the wheat improvement program of The Pocket in Indiana.

PAYING GUEST

(Continued from page 75)

tion by trying again a second, a third, and even perhaps a fourth time if the hen survives the nest destruction. The fourth try, after most of the summer is spent, will end in failure. The young won't mature enough to withstand the winter.

The Bobwhite quail is a most persistent parent. Either one of the pair will care for the little brood alone, should its mate be killed. More surprising is the known fact that a bachelor cock will just as diligently care for a foster brood if he can find one. Throughout the rearing of the young, many pairs are confronted with the unwelcome presence of an unmated cock or two. When seen together in close observation, the unmated cock bird is known by his shabby-feathered appearance, resulting from repeated attacks by the parent male. The old bachelor suffers these indignities and pain every day, just to be with the coveted family. Bobwhites are devoted to their young.

The foods of spring and summer are essentially insects, greens, and summer ripening seeds and fruits. They take what they can get. Insects, more than any other foods, support quail and their growing chicks from early spring until fall.

Throughout the spring and summer days the nesting birds and their offspring need a daily bath. They need no water bath, as many birds enjoy, but dust baths to keep the mites and lice in check, for Bobwhites live with these annoyances. Much of the day is spent in dusting, between the mid-morning close of the early feeding period and before the late afternoon feeding begins. This is their loafing period, a time to dust themselves and

QUAIL are family birds. The male (left) stays close to his mate during summer.

complete their toilet by preening their feathers. They also sleep in their daytime retreat.

But all through the summer heat they can live without drinking. Water is not a major need of quail. Many people have wasted kindly efforts building watering troughs for Bobwhites, hauling water to keep them filled, and have even drilled wells to furnish the birds this element which they can do without.

It is hard to believe that quail find dust much more essential than water. Herbert L. Stoddard, the country's leading quail expert, says that quail need no surface water in the Southeast, but his book also started the rumor that dew would satisfy the needs of moisture when surface water was lacking. Actually quail require no water at all, not even dew.

On a ranch in western Oklahoma during the history-making summer droughts of 1933, 1934, and 1935, weeks passed with no drop of water, dew or rain. Temperatures went above 100 degrees day after day, reaching 110, 111, and 112 in several mid-afternoons. In 1934, the longest period of no dew or rain whatsoever was 62 days in June, July, and August. Young quail far from water survived in excellent health.

Within the 10,000 acre area around this ranch, where Bobwhites were carefully studied, the only surface water was at four stock-water tanks. The tanks ran over on windy days. Quail within walking distance did not come to the open water. They could not have gone without leaving tracks. Even the grasshoppers left the plainest of tracks in the powdery sand around the ponds. Most of the coveys were a quarter-of-a-mile away. Some were a mile from the water tanks.

Some Will Drink

This does not mean that Bobwhites will not drink water, for during the same period the windmill on the ranch pumped water which overflowed into some high weeds, a place of good cover for the day. When the windmill failed to turn, as it often failed for two or three days in July and August, the water seeped away into the sand. The covey of parents and half-grown birds would come into the yard, and line up around the lily pond to drink. They evidently had become accustomed to water every day.

A belief that water is essential is understandable. Many farms actually sup-

THE BOBWHITE needs but little water. Dust baths help keep body parasites in check.

"Head Man" in a SACCO-FED Herd

CARNATION HOMESTEAD RELIANCE:
Senior Sire of the Nantom Farms herd — 170 head of high-scoring Registered Holsteins.

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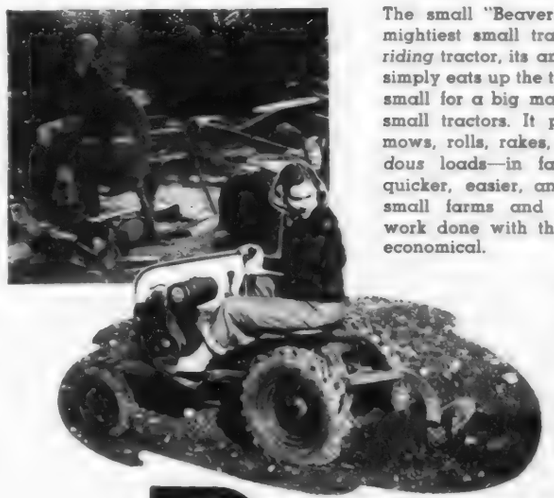

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port quail only along the living streams and springs. The reason is obvious in most cases. Only in the added moisture of the creek area is food in sufficient abundance. The amount of quail food growing on moist land is greater than nature provides on drier soils.

Bobwhites can get their moisture from insects, from green leaves, and from seeds and fruits.

When Autumn Comes

By fall a significant change becomes apparent in the size of the Bobwhite families. They no longer live in separate pairs. Not every pair has raised a family. Many have failed. But everyone will join some more fortunate group for the winter. Thus the quail population is grouped in coveys averaging 12 or 13 birds per covey with some young and some old birds in each.

Most of the young birds have matured by October or November by which time they are usually 13 or 14 weeks old. Only an occasional covey includes half-grown birds or "peepers."

Fall is the season of plenty in many places. Food is then more abundant than at any other time of the year, more plentiful than the birds can use. Cultivated crops have matured. Sunflowers, ragweed, lespedezas, beggar-weeds, acorns, and pine seeds seem to be everywhere. The whole summer's production is ready for harvest and storage. Yet there are notable exceptions such as in pastures, and fields of winter wheat. These exceptions apply to parts of almost every farm within the Bobwhite range. Livestock have prevented seed production of the grasses; plowing has destroyed the waste grain and weed seed in preparation for the fall seeding. Haylands, too leave little for Bobwhites. So there's sometimes a falseness in the seeming security of fall abundance.

Fall also brings the beginning of quail food destruction on the farm. In the dairy country of Minnesota and Wisconsin, corn is cut for the silo or hauled to the barn, leaving no waste grain or overhead cover in the fields. Livestock are turned into the crop fields to glean a few weeks' "pickings" of stalks and weeds and grass. Blackbirds, sparrows, rabbits, deer, rats and mice consume great quantities of the Bobwhite foods. As autumn wears on, their foods are reduced day by day. Ragweed, sunflower, and grain are consumed. Seeds on the ground are trampled into the soil. The grasses that might have given comfort through the cold nights are eaten away or trampled down. Insects crawl into the ground or disappear for the winter. Abundance changes to scarcity very quickly!

Winters Are Rough

Where will the covey spend the winter, in the same thicket, around the same field where they lived the winter before? Sometimes they do. Often they don't. They settle down for the winter wherever they find plenty of food in or near good cover.

It is not generally known that great numbers of Bobwhites are forced to move from summer range to new winter quarters. Sometimes it is only a few hundred yards. Ofter, however, the distance is in miles. The coveys move from the pine ridges to the hummocks in the South; from the oak lands to the fields and valleys of the Ozarks; from the prairie grasses to the thickets all over the range. On the other hand, thousands of coveys hesitate in borderline situations: enough food to be secure in November, but utterly lacking in food a month or two later. Where can they go? Nowhere with certainty. Some stumble onto new foods with enough cover to protect them. Others drift on in partial starvation.

The Bobwhite now live and rear their young among 80 million people in the 32 states of the Bobwhite range.

Unfortunately quail do not know where to go to find winter food. The best way to help these quail is to take food to their summer range.

Thus a first step in land management to increase Bobwhites is to grow food for a covey where no birds could exist the winter before; not forgetting to provide for the coveys in their old locations, too.

The winter-food requirements of Bobwhite quail are simple. Quail eat many kinds of seeds but can survive where there is a plentiful supply of one of their favorites. In the Southeast bicolor lespedeza will suffice. Corn is still the staple food across the Northern states. Through the semi-arid western part of the range the grain sorghums are stalwart, but imperfect sources of food. Soybeans support quail as long as the beans are available.

If they find enough food and cover throughout the winter, and hunting and predators are not too severe, the birds we began with in the spring will complete a year's cycle of life, and pair off again. Sometimes it is the same mate, more likely a different one.

In any case, the coveys abandon winter quarters when the first warm days of spring appear. They begin family life again in millions of separate pairs across the range. New families are in the offing and the Bobwhite starts again on the life cycle which is as old as the species itself.

THE AUTHOR: Verne E. Davison spent much of his boyhood on a 100,000 acre ranch in western Oklahoma. As he grew up he became increasingly interested in the wild game in the canyons and hills around his home, and induced his father to set the ranch aside as a state game refuge. In 1935 he joined the Soil Conservation Service with which he still serves as biologist. He has developed several widely accepted practices of managing land for wildlife conservation. Davison has written widely in both government bulletins and popular publications on wildlife subjects. His *Paying Guest* is a chapter from his recently published, widely accepted, first book *Bobwhites On The Rise*.

GOODBYE NELLIE (Continued from page 33)

functions of steam it appeared that Nellie would become either a museum piece or a hunk of junk.

Then in 1949 it happened; Nellie had a buyer. A few years before Mennonites from the United States and Canada had migrated to Paraguay, founding a colony a thousand miles up the Paraguay River, deep in the wilderness, ages away from electricity. They needed power to run their sawmills to cut lumber to build their houses. From Volendam, Paraguay, Art Young got the call for four steam traction engines.

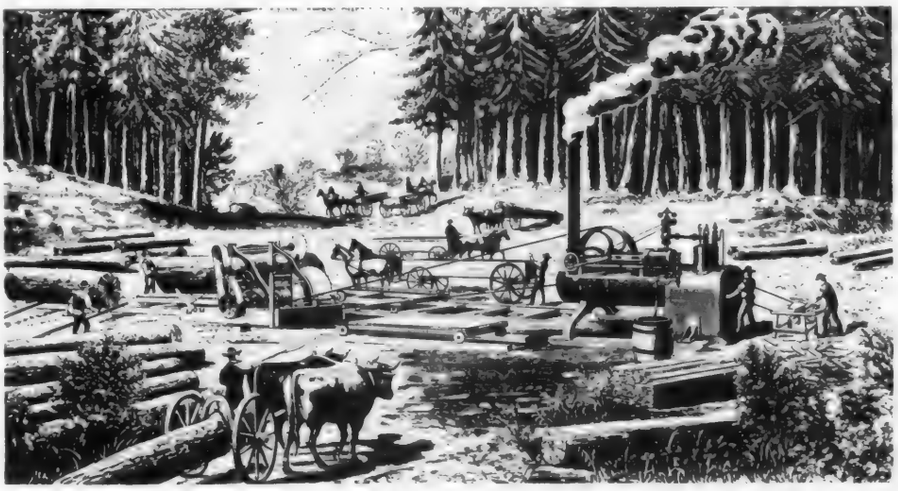
Nellie was given a fresh coat of paint and the bit of brass on her cylinder was polished. She and her three colleagues were driven onto a flatcar, hauled to New York, loaded on a ship, and crossed the Equator. They were trans-shipped to a river steamer at the mouth of the Paraguay and were carried to the headwaters. There they were fired with strange wood and under their own power made the last leg of the journey to the Mennonite colony.

On a different continent, in a semi-tropic wilderness, they are now huffing and puffing, driving sawmills to build a new outpost of civilization. The four engines at Volendam recall the boast of old steam men—an engine never wears out.

Young's Snug Harbor

Steam traction engines have not been manufactured since 1930. Here and there the veterans, all at least twenty years old, are powering the rare threshing rigs and the back country sawmills. In Lancaster County, Pennsylvania, where not so many years ago all the threshing was done by steam, only one outfit will be working this year.

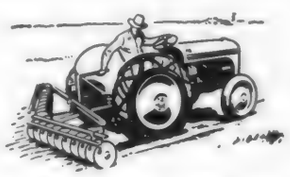
Art Young operates a hardware store and machine shops which serve the farms in the neighborhood. A former steam engine man, he bought his first steam engine as a nostalgic memento of his youth. Engines became his hobby, and being a practical man, he turned his hobby into a paying business. Now he is the biggest dealer in used steam engines and their by-products in the country. In Young's shops and yards are old engines in all



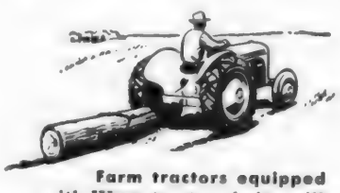
A PORTABLE sawmill of the middle 1880's. This outfit was made by J. I. Case and advertised in the 1884 and 1885 catalogs. Traction engines were often used for power.

SAVE TIME WITH WEED FARM TRACTOR CHAINS

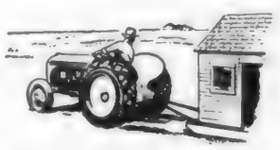
No costly waiting after rain to plow, cultivate or harvest. Save hours, even days, with WEED tractor chains.



Weed tractor chains keep your rubber tired tractors rolling when ground is too wet to work without them.



Farm tractors equipped with WEED tractor chains will not spin or side-slip in mud or gumbo.



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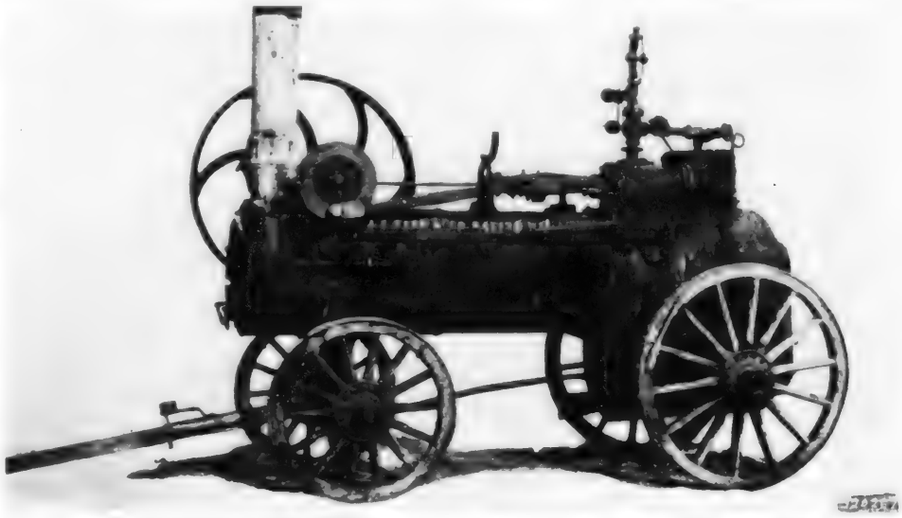
degrees of repair and disrepair. Some are being reconditioned, some are being cannibalized to furnish parts. Remnants have a sales value considerably above scrap. There is a constant demand for the boilers (smokestacks attached) by farmers, cheesemakers, welding shops and other small businesses with unique power problems. Young heats his own shops with dismounted boilers, firing them with wood or coal. Engine skeletons became spare parts. Amazingly few parts of even the oldest engines are worn out—the bull chain which operates the steering mechanism is the first to show signs of wear. Boiler tubes sometimes rust out if left unprotected for a few years. These are replaced by tubes from the scrapped engines.

collection at $25,000.00.

He recently sold a TT Peerless to an elderly farmer as a plaything. The man had operated a similar engine in his earlier years, had retired, and wished something to occupy his mind. Now he fires up the relic periodically and drives it around his barnyard.

Every year Young stages a picnic reunion for old steam men and their families, turning his engines over to them and providing them with fuel, an audience, and an arena. In 1949, 1250 people from ten states attended. The 1950 picnic-reunion will be held in August.

Young pays as high as $700 for old engines, the price he paid for the J. I. Case which went to Paraguay. Other engines have cost him only the trouble and labor of hauling them away. Some of these have been expensive enough, traveling by train from as far as California. Engines from the East last about five years longer than those from the West, on the average, because uniformly they are better cared for. The estimated life of a new steam traction engine was 25 years if steadily used. Properly cared for they lasted longer, and seldom needed repairs. Some of Young's engines have been used 40 years and more and still have years of service in them. Young can recondition an engine to sell for about $1500-1600, about half its original cost.



HORSE-DRAWN ENGINES preceded the traction models for threshing outfits, but were made until the early 1900's for stationary power uses.

In the slowly moving line with Palmer's J. I. Case was an old Scheidler, also about 25 HP, drawbar. Its history was lost under its rust, but it had traveled east from western prairies where it had been through numerous grass fires which had nibbled at its wheels and belly.

Among the engines Young has reconditioned and sold in recent years are: An engine built by the 20th Century Manufacturing Company of Swanton, Ohio; a Frick Eclipse; a half dozen J. I. Case jobs, including one or two built about 1888-90; an old Westinghouse Upright with a V-belt drive; another upright which, Young explains, has a "return flue with downdraft"; a McNamar 10 HP (drawbar), which threshed wheat in Ohio in 1895; an 18 HP Huber; an 18 HP Garr-Scott; a 16 HP Advance; a 16 HP Leader; a Case 65, a return flue, simple cylinder straw-burning tractor which operated a Columbian Victory Separator in the Midwest, thirty years ago; a 20 HP Hamburg; a Double Star (Peerless); a TT Peerless, about 12 HP; a Center Crankcase engine; a Birdsall, and many others. His prize is an 1886 Springfield Portable in good condition. This engine is not for sale. He has about 30 engines in his shops now, excluding the emasculated wrecks he uses as a source for parts. He values his

When the demand for used steam engines peters out, as it will when the last tube is rusted through and the last cylinder cracked on the wobbly veterans now in use, Young hopes to establish a museum for those which he holds in his collection. There the engineers of the atomic age may see and marvel at the awkward contraptions which served our country so well when it was young.

THE AUTHOR: Arthur J. Burks grew up around Spokane, Washington, on his mother's homestead farm and got his first job as a traction engine driver in 1917. He was one of the first white settlers on the Colville Indian Reservation, served in the Marine Corps in the First World War, and has spent the interim in writing and service with the Corps. He now lives in Pennsylvania among the Amish.

THE BATTLE OF THE BILLABONGS

(Continued from page 87)

money in Australia. They market both the pelts and carcasses and the processors and shippers profit just as handsomely. When there is a glut in the market on meat and pelts the farmers pay the trappers almost as well to go on exterminating.

Present day profits were chicken feed to what they were sixty or seventy years ago when the State governments first began offering bounties on rabbits. The rabbiters then were almost in the same class as gold miners who had struck it rich. Their badge of office was a small silver rabbit, worn on the watch chain, and it became the sign of a prosperous industry. Trappers drove about in four-in-hands and their women-folk wore satins and silks and regarded Bugs Bunny as a wonderful creature. One trapper, after a particularly good haul, filled a large bath tub with champagne and invited in all his friends. "Have one on the rabbit," he shouted.

Today the trapper, even though he is in an industry that will continue to pay him big money only so long as the rabbit continues to be a menace, does his best to cooperate with the farmer and government in finding methods of quick and effective extermination.

For a long time scientists of the Council for Scientific and Industrial Research Organization, a Federal government project, worked on a scheme whereby the rabbits would be killed off by spreading disease among them. They came up with a virus, *myxomatosis cunculi*, known to be deadly to rabbits. But the rabbits took *myxomatosis cunculi* in stride; they developed an immunity and went right on multiplying, more hardy than ever.

Weasels, ferrets and mongooses were at one time introduced in the hope that they would clean out the rabbits. This was given up for a number of reasons, chiefly because the weasels, ferrets and mongooses

THE PROFESSIONAL rabbit catcher scorns steel traps, too slow for mass extermination.

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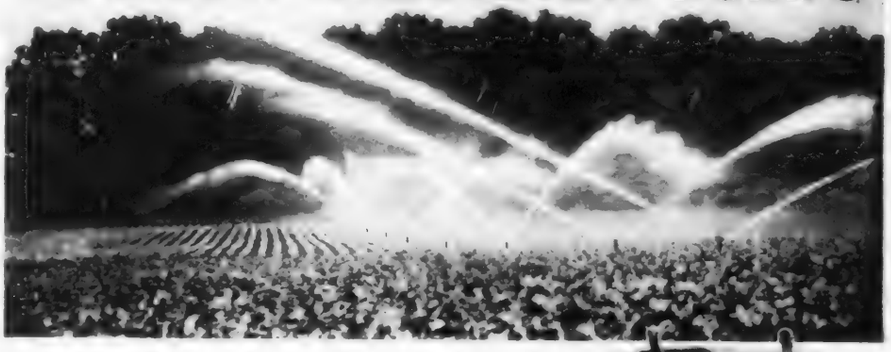
MARLOW IRRIGATION PUMPS



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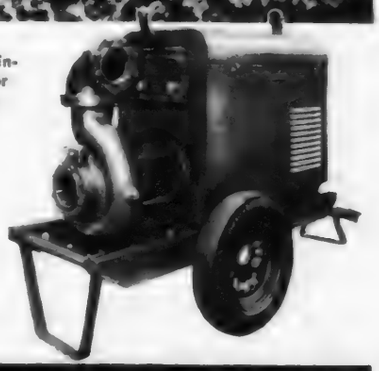

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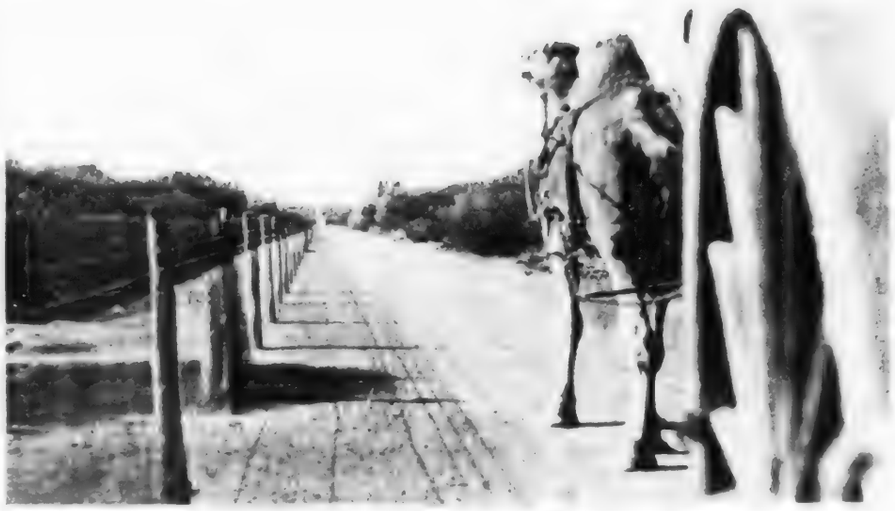

CAMELS, once used by fence patrols on the desert, are being replaced by jeeps.

failed to make a distinction between the rabbits and the farmers' poultry. Those that were introduced disappeared, apparently the victims of over-eating, or as some say, eaten by the rabbits.

Now the farmers are using gas, suffocating the rabbits in their burrows. At first they used all sorts of gases, from the smoke of a wood fire to the exhaust fumes of a tractor, but recently cynogas has become increasingly popular. This is hydrocyanic gas, given off when a powder made from calcium cyanide comes in contact with air moisture. It is safe and cheap to use and has the distinct advantage of killing the rabbits in their burrows, where they can be sealed off and thus will not attract blowflies and contaminate the atmosphere.

The most widely publicized means of curbing the rabbit has been the rabbit-proof fence. Western Australia, on the far side of the continent from New South Wales, had hoped that the vast Nullarbor Plain, a wide treeless desert stretching across part of the states of South and West Australia, would be an obstacle for even the most adventurous rabbit. But by the end of the early 1900's the rabbits had begun to trickle across the desert and the West Australians decided it was time something was done.

In 1901 they began to build what is perhaps the longest unbroken fence in the world. It runs 1139 miles from Starvation Boat Harbor on the Great Australian Bight to a point on the Ninety Mile Beach on the far north coast. The building of the fence resolved into a race with the rabbit and it looked at times as if the rabbit was going to win. Once his scouts had shown the way, hordes followed across the desert. In the lush fields of West Australia he lost no time in establishing himself. So as the first fence was going up, another was begun 75 miles farther west. This second fence curved away to finish at the sea on the west coast. A third fence was built to put an additional barrier around the valuable wheat belt. By the time the job was finished there were 2023 miles of fence, broken only by special rabbit-proof gates and railway crossings. The undertaking had cost $1,130,000.

The fence is of wire mesh, buried six inches into the ground and reaching about three feet above it, with three plain wires and one barbed wire reaching another 18 inches above the mesh. There are wood posts, 12 feet apart, supporting the fence, except for a few hundred miles where the fence crosses dry sand plains, and here iron posts have been found more serviceable.

Patrol officers are employed to keep the fence in good repair. Riding camels, in the desert, each officer is responsible for 100 miles of fence. He makes repairs to all ordinary breakdowns and damage, but in flood times, when miles of fence are sometimes washed away, he can call on a gang of repair men who are rushed to the spot with all possible speed.

Controversy about the value of the fence has never ceased. The answer seems to be that, although he is a serious pest in Western Australia, the rabbit has not over-run the country as he has in the eastern states.

Now, in the East where he swarms over the land like a plague of locusts, measures are being taken to find a final solution to the rabbit menace. There seems little point in erecting a rabbit-proof fence at this stage, although many properties are independently protected by fences. Poisoning hasn't been successful. The thousands of carcasses lying about in the hot Australian sun made breeding places for blowflies, another menace to sheepherders, and the poisoned baits and waterholes often did greater damage to livestock. The trappers are effective up to a point, but they can't kill as fast as the rabbits can breed. The best measure so far seems to be the cynogas, but the rabbit population is so large that it will be some years before the exterminators know which side is winning.

COWFEED FROM AIR

(Continued from page 61)

something new in the world. A cheap synthetic source for nearly half the protein needed by cattle and sheep—urea. This is an extremely important addition to our feed stuffs. Before we had urea, we unconsciously avoided cellulose to raise the proportion of protein. Now we can consciously feed cellulose and balance it with urea. For every pound of protein we supply with urea, we can feed six pounds of cellulose. Actually, when we produce one pound of protein from urea, and add another six pounds of cellulose, we have increased the world's cow feed by seven pounds, because there is already too much celulose, and there is no end to synthetic urea. Not much urea has been used in cow feed so far, but it looks important enough for the future to demand facts on how it works.

Chemically urea is "carbamide," an amide of carbon. Amides, amines, and amino acids are the building blocks of proteins. They all contain nitrogen, a component of ammonia. Urea is made from ammonia and carbon dioxide. Several hundred thousands of tons of ammonia are manufactured each year for fertilizer and there is an unlimited supply of CO_2. Urea is cheap enough to be used as a fertilizer. However, it is well to note here that nitrogen fertilizer is not the answer to the protein needs of th world. Most of the nitrogen added to the soil comes back in the form of the plant proteins, but the growth of the entire plant is encouraged so that there is not a much higher proportion of protein.

No animal can use urea directly any more than it can digest cellulose with its own digestive juices. Bacteria in the alimentary tract perform the necessary functions of breaking down the cellulose on the one hand and building proteins from the urea on the other. In cows and in sheep this bacterial action takes place in their rumen. The feeding of urea as a protein source is restricted to ruminants. Essentially, the bacteria use the cellulose as a source of fuel, the urea as a source of protein in the rumen: then the cow digests the bacteira in the subsequent part of her alimentary tract. Unfortunately, urea cannot supply all the protein a cow needs. For some reason she must also get some natural vegetable proteins.

The first test with urea seemed to indicate that it could supply only 25% of a cow's protein. Now it is recommended up to 40%. Maybe we can learn how to go higher. Maybe we can find other synthetic materials to provide protein. Almost certainly we will know more about this in a few years. In the meantime, it might be well to describe the cob-feeding experiments. Ohio State University, the University of Nebraska, and other stations have done a great deal along this line. Among private experimenters, Roswell Garst, of Coon Rapids, Iowa, is outstanding. Dur-

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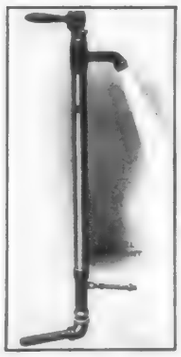

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BOYT CRAFTSMEN IN LEATHER AND CANVAS WHERE **STRENGTH** IS REQUIRED

TO FIND OUT what feed does on its way through a cow's several stomachs, what comes out must be caught, weighed, examined and analyzed.

ing the past three years a total of 2200 head of steers have been fattened on corn cobs in Garst's feedlots.

A typical ration has been 2½ lbs. alfalfa, 2½ lbs. soybean meal, 2½ lbs. molasses, ¼ lbs. urea, 18 lbs. ground corn cobs.

On this ration in the summer of 1948, steers gained one and three-quarters pounds per day for a 120 day feeding period. These steers were about equivalent to steers fed 90 days with 20 pounds of corn instead of 20 pounds of cobs, molasses and urea. Their total gain and their dressing percentage were about what would be expected from 90 days of corn feeding. Their meat graded as well as corn fed steers. In other words, the cobs plus the molasses-urea proved about 90/120 or three-quarters as good as corn. Present recommendations would raise the molasses-urea to four pounds instead of two and one-half pounds. In any case, here is good evidence that waste cellulose can be made into an economical, fattening cattle feed when balanced with molasses and urea.

How Urea Works

There were several things to be noted in this trial. First, the cobs were ground to a coarse meal. Cattle reject pieces as large as a walnut. It is probable that any cellulose feed will have to be ground or chopped. Secondly, the urea was fed dissolved in molasses at a ratio of ten parts of molasses to one part urea. There is enough water in the molasses to dissolve the urea and this makes a convenient way to spread the urea evenly through the feed. The breakdown of the cellulose in the rumen is due to bacteria, and the sugars in the molasses and the ammonia in the urea quicken the bacterial action. Steers will eat several pounds more cobs a day when fed molasses-urea. This is not due to the molasses-treated ground cobs being more palatable, because the cobs and molasses can be fed separately with the same result. It is no doubt due to faster action in the rumen which allows the steers to eat more. The use of molasses with urea to stimulate the bacteria may be one way to increase the percentage of protein that can be provided by the urea.

Lose Weight In Winter

Actually, of course, in the history of the world, almost all cattle have been wintered on cellulose, but they have lost weight instead of fattening. However, the farmers of Scotland normally fatten steers on oat straw. Cattle are not fed oat grain in Scotland; they get "neeps", "strae", and "cake", that is, turnips, oat straw, and linseed, cottonseed or some other oilseed cake. This is a good fattening feed. In the United States the large amount of cake to balance the low protein straw would probably make such a feed as expensive as grain. Besides, we do not have the turnips. It seems probable that the turnips in Scotland have the same value in quickening the bacterial action in the rumen as the molasses in the Iowa experiments.

All cellulose is not equally digestible for ruminents. Wood is composed mainly of

cellulose, but it cannot be utilized as feed in its normal form. Some straws can be used as feed, such as oat and barley straw, while others, such as wheat straw, are unsatisfactory. This difference is due to several reasons. The physical qualities of the cellulose feeds must be such that the bacteria can attack the cells and digest them. If the cellulose is formed into hard tough fibres, the bacteria cannot readily use it for food. If, on the other hand, the cellulose is easily broken down in the rumen it makes good feed. Another reason for the difference in cellulose feeds is due to a chemical named lignin. Lignin forms the bond between the cells in plants. In some plants the bond is not strong enough to keep the bacteria from attacking and digesting the cells, but in other plants, such as trees and bushes, lignin runs as high as 30 percent of the total weight and forms a very strong bond. This is the reason sawdust cannot be used as cattle feed in its natural form. If this bond is broken and the lignin is removed, as is done to make paper pulp, then the remaining cellulose will make good cattle feed. In tests at the University of California at Davis, it was found that paper pulp when fed to ruminants had about the food value of starch. This has been used in some countries when feed was very scarce. For instance, Norway fed processed sawdust during the war. However, the process required to make paper pulp from wood is normally too expensive to be used in making cattle feed.

New Machinery Needed

It is difficut to estimate the significance of feeding cellulose, urea, and molasses. In the corn belt it should mean the use of cobs, corn and cob meal and more silage. Increases in the use of straw and dry corn stalks will depend, in part, on new harvesting machinery. In more tropical areas, such as the cotton belt and the tropics, where grain is hard to produce but where plant growth is very luxuriant, these new findings may well be revolutionary.

Good cellulose, plus molasses and urea, has about three-fourths the feeding value of grain. Cellulose and molasses are both abundant and cheap in warm countries. Urea is so concentrated as a protein source that it will be inexpensive to ship in. Oil cakes for vegetable proteins are already produced to some extent.

There is a good possibility that with these food sources, plus supplementary minerals, the warm lands might be brought into profitable cattle production.

THE AUTHORS: The modest Garsts believe that what they are doing is more important than what they are. But it is known that Jonathan became a farmer after obtaining his doctor's degree from the University of Edinburgh, Scotland. He is now a grain farmer in northern California. His son, Perry, has a thorough technical background for his research in cattle feeding. He has conducted many of his experiments on the farm of his uncle, Rosswell Garst, of Coon Rapids, Iowa, and is now at the Escuela Agricola Pan Americana in Honduras, trying out urea on tropical carbohydrates and molasses.

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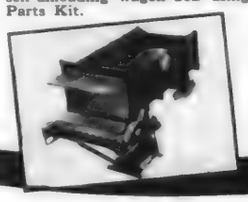

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THE DAIRY BARN

(Continued from page 18)

the disease, or even preventing it. Farmers whose cattle contact the ailment might do well to shift the herd to new pastures as a precaution.

Calves Without Milk With whole milk at present high prices there is a constant search by dairymen and dairy scientists for a good method of raising calves without feeding them milk. One of the more recent, and promising developments in this research came out of the USDA, Bureau of Dairy Industry. Henry T. Converse of that Bureau, has shown how to raise calves with no salable whole milk and only a small quantity of skim milk.

After experimenting with calf feeding over the past 20 years Converse has decided that they are often fed more milk than they need. The standard method of feeding a dairy calf calls for about 550 pounds of whole milk and 2900 pounds of skim milk. Converse has succeeded in cutting the skim milk down to 280 pounds for some breeds and 460 pounds for others, depending on the breed, and eliminating the whole milk entirely. He feeds colostrum for three days, switches directly to skim milk, and at 10 days of age adds leafy fine stemmed hay, a palatable high protein grain feed to the ration. While the calves are on skim milk they also get two to four teaspoonfulls of cod liver oil or seven ounces of grated carrots daily to supply vitamin A.

Converse reports that the total feed needed by the test calves to one year of age was 200 to 400 pounds of skim milk, 475 to 550 pounds of grain and 2500 to 3500 pounds of hay for Holsteins. The Holstein calves were weaned at 30 to 60 days; Jersey calves were weaned at 45 to 60 days.

Second Exposition The Second Annual International Dairy Exposition will be held at the Indiana State Fair Grounds this year from October 7 through 14. This is the largest collection of purebred dairy cattle ever brought together. The management expects 3,000 entries of all breeds from all over the United States and Canada.

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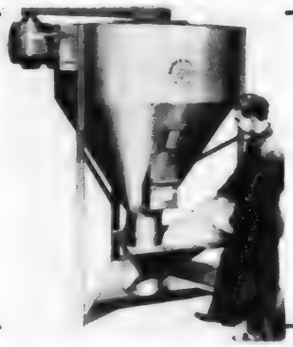

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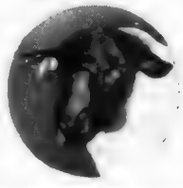

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THE POULTRY YARD

(Continued from page 14)

flourishing domestic industries in the Islands. To this date no foreign demand has developed.

In the preparation of balut, a duck egg is kept in an incubator until it is almost fully developed, which takes about 18 days. The hand-woven bamboo incubators are about 3 feet high and 2 feet in diameter. They are barrel-shaped and their ten trays hold 1000 to 1200 eggs.

The unhatched duckling, hard-boiled in the shell, is known as balut. Balut eggs are sold by peddlers who keep them warm in well-covered baskets. To the Filipinos balut takes the place of meat since the well-formed embryo is soft and has a fine meat-flavor, while the hard-boiled yoke has the taste of blood: there is also juice in the shell, which is drunk with great gusto. To eat the balut, the egg is cracked at one end, the juice sipped and then the rest picked out with the fingers.

Turkey Malaria is Curable. Mosquitos do not bother turkeys, but that doesn't stop the turkeys from getting malaria. The culprit that causes the infection has been identified as the black fly, a small insect which thrives in swampy areas or stagnant water. As with the mosquito, and some other species, it is the female that is dangerous. She bites only in daytime and carries the infection from one bird to another by ferrying the germ. So far as is known, the germ doesn't bother the fly.

Turkey malaria symptoms are readily recognized. The birds become listless, droopy, lose appetite, lie down, and, in the later stages, move slowly, sink into a coma, and then die. In poults the onset of the disease is sudden. In male birds their love life wanes; infected toms do not strut and have no interest in hens. Birds recovering from malaria can carry the infection for several months. Autopsy of infected birds has disclosed jaundiced livers, enlarged hearts, and a remarkable thinning of the heart wall. Though this blood infection closely resembles human malaria, it cannot be transmitted to man.

Recent investigations by Dr. Bert W. Bierer of Columbia, South Carolina, offer strong hope that turkey malaria can now be controlled by the use of sulfaquinoxaline in drinking water if used in the same concentration and dosing schedule as recommended for coccidiosis. This treatment considerably reduces the losses, which in the past reached up to 50 per cent of all poults in infected areas.

The recommended dosage for control of coccidiosis and malaria in turkeys is: 0.025 per cent solution of sulfaquinoxaline as the only source of drinking water for a two day period; regular water for three days; again 0.025 per cent medicated water for one day; three days on regular water; and one more day on the medicated water. This same remedy can be continued intermittently if necessary.

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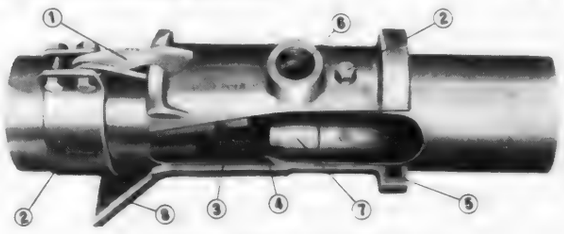

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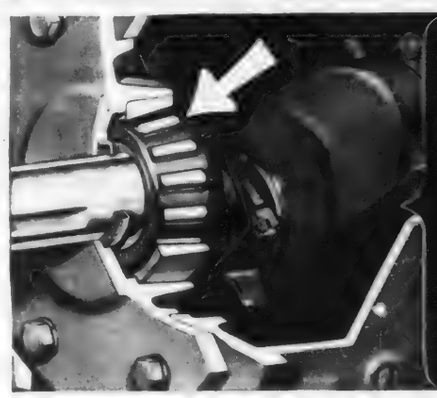

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THE AUTHOR OF *It's Fair Time*. Because Josephine W. Johnson's article *It's Fair Time* completely filled its allotted pages we have moved the customary authors biographical note to this position. Miss Johnson was born in Missouri and raised on a farm there. She is the author of three novels, a volume of short stories, and a book of poetry. When she was 23 she wrote the farm novel, "*Now in November*," which was awarded the Pulitzer Prize. She has also won the O'Henry Memorial Award with her short stories and has appeared in the O'Henry and the Best Short Stories collections. This is her second appearance in *The Farm Quarterly*, having written The Sisters for the Winter 1948 issue. In private life Miss Johnson is the wife of Grant Cannon. *Farm Quarterly* Managing Editor.

FARM BOOKS

(Continued from page 20)

Following are reviews on three of the most recent:-

Pastures, *by Robert R. Lancaster, Edwin James, Richard Y. Bailey and Roland Russell Harris, Turner E. Smith & Company, Atlanta, Ga. $2.96*

When the authors date the introduction of a pasture grass as "shortly before the War Between the States" and when they write of Kudzu with almost religious awe, it is not surprising to find that two of the authors come from Georgia, one from South Carolina, and one from Texas. Nor is it surprising to find that the heavy emphasis of the book has to do with establishing year round use of pastures which, if achieved, can change the whole livestock picture in the United States. It might have been well to have titled the book "Southern Pastures", which would more clearly identify the contents.

The authors have produced a 500 page, easy-to-read book that should serve as an introduction to pasture plants and problems of growth and management. It may also serve as a practical guide for farmers south of the Mason-Dixon line in extending the number of days they can let the animals do their own forage harvesting. The book is made much more readable by the inclusion of informal experience stories from farmers who have faced the problems of year round pastures. The authors do not, however, forget to include lists of pasture seed mixtures, information on liming and fertilizing, seed inoculation, planting and management that make it possible to piece out a year-round grazing program as far north as Missouri.

The book is not alone concerned with the cultivated permanent pastures and the summer and winter pastures that supplement it, but also takes up the natural pastures of the southwest range and the range management problems of that region. There is a chapter on fencing, one on haymaking, and one on silage production.

Forage Crops, *by Gilbert H. Ahlgren McGraw Hill Company, New York $5.00*

In the north, haymaking and silage production are farm enterprises of major importance because, for the present at least, severe winters prevent year-round pastures. The whole emphasis of Dr. Ahlgren's book is on the production of forage crops and their conversion into hay or silage. Occasionally he touches on pasture problems, but this is in the nature of an aside.

The first section of the book takes up the individual forage crops and covers each of them with an impressive thoroughness. For each of the major crops there is a chapter which covers the history and adaptation, the varieties of the crop, the cultural practices that are used in planting and growing, the yields and fertilizer requirements, the time of cutting for best results, the feeding value, and a list of references. An enor-

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mous amount of information is packed into the book through the use of charts—the author uses 393 of them throughout the book—which help illustrate each aspect of the general problem.

The second part of the book takes up the general problems that are common to all hay and silage making. Hay standards, quality production, forage mixtures, the making of grass silage, and the labor saving programs that have been devised are treated in this section.

Though this book is written with rather a dry, scholarly tone, it is packed with facts and is not difficult to read. Botanical drawings, maps, charts, and photographs are used with good taste throughout the book and help relieve the pedestrian style.

The Pasture Book, *by W. R. Thompson, State College, Miss. $3.00*

The third book on pastures has the carefree informality of a stove-side discussion in the crossroads grocery. The author who is also his own publisher, has made profligate use of photographs, drawings, charts, cartoons. The book not only contains chapters of sound advice on the growing of grass, but also such odd items as a few pages of letters of endorsement for the pasture program, advice on how to clear a muddy pond, an illustrated insert on sticking for bloat, the names and addresses of the leading cattle associations, and directions for dusting for cattle grubs and hog lice.

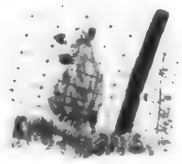
Like *Pastures, The Pasture Book* was written for southern farmers. The author, who is Extension Pasture Specialist, State College, Mississippi, has aimed his book directly at the farmer who cares more for help in starting and maintaining his pasture than for theory. The sophisticated reader may be amused to find in a book on pastures everything from building a cattle gap to cartoons showing how to take a soil sample. The farmers, however, have shown that this is just the book they have been waiting for—at least, 85,000 copies were sold between June, 1949 and December, 1949.

PIGS from Cave to Corn Belt, *by C. W. Towne & E. N. Wentworth, University of Oklahoma Press. $4.00*

In the opening pages of this book the authors say, "Much ado has been made about clever colts, cute calves, and cunning lambkins. But who has ever rhaphodized about a pig or enjoyed the close companionship of a hog?" The remainder of this witty history of the hog corrects this oversight. A chapter from this book is reprinted in this issue of *The Farm Quarterly* on page 82.

The Farm Book Store

The Editors of the Farm Quarterly, after a careful selection of current agricultural books, recommend the following to our readers.



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A review of this book may be found in the Farm Books Column.

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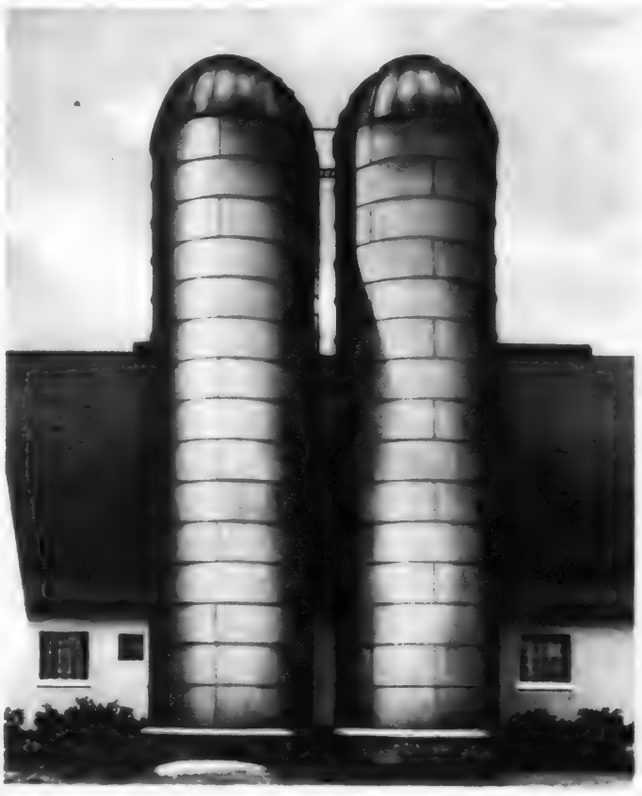

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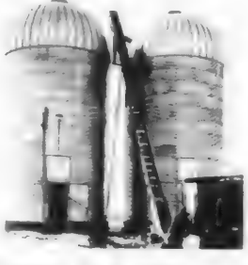

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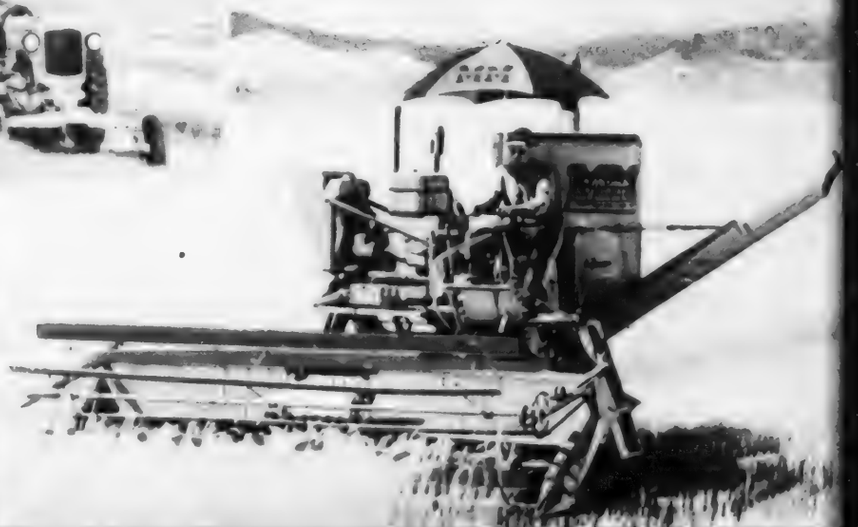

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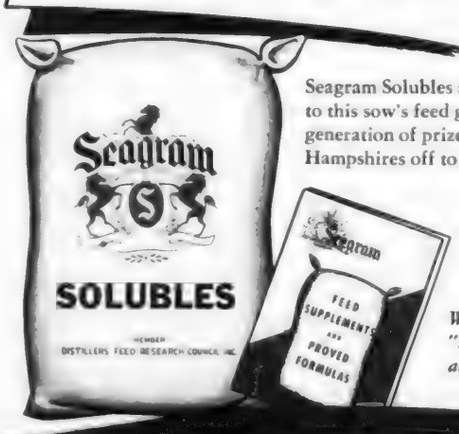

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"I run my Farmall tractor about 600 hours a year—about like the average owner. Most of the time it's at top throttle with a full load.

"That means my Farmall is used as much as an automobile that runs 25,000 miles a year. And you know any car or tractor needs overhauling after a few years of hard work like that!

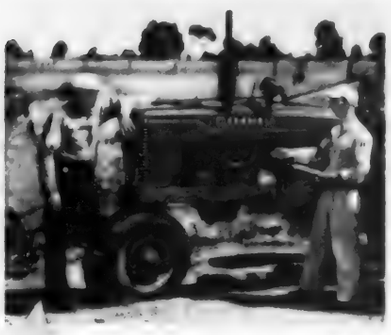
"So I figure that the kind of repair service you can get for a tractor is important to think about before you buy. I've found my IH dealer's 5-Star Service so good that it's one of the big reasons I always own Farmalls.

"This 5-Star Service makes my work-worn machines run like new again, so I can do each job while the weather's right. It saves me money because I use both tractor and tractor-mounted equipment many extra years."

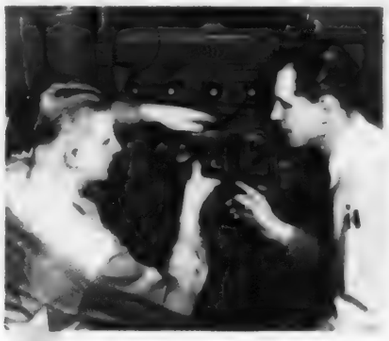
THOMAS C. ELLIS (Address on request).

★ ★ ★

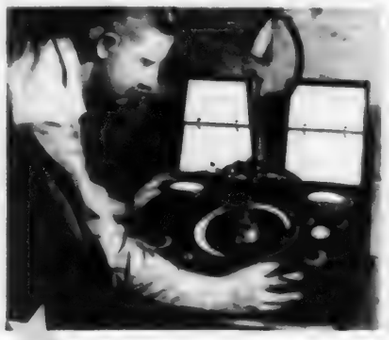
Yes, IH 5-Star Service is top-quality service. You'll like these five important advantages:



IH PRE-SERVICE INSPECTION. Your IH dealer can tell you—in advance—what servicing is needed and about how much the job will cost. The IH Inspection Guide helps him check on as many as 25 points on each of 25 different tractors and implements. It helps him give you the most accurate possible estimates, too.



IH-TRAINED SERVICE MEN. In your IH dealer's shop, your work will be done by one or more of the 18,000 IH-trained men who service IH products the year 'round. Their specialized training and experience mean that your work will be done in the best, most efficient way. That assures you of a dependable, long-lived overhaul job.



IH-APPROVED TOOLS. Servicing your modern tractor and implements *right* requires many special tools and testing devices. IH dealers use more than $20,000,000 worth of this precision equipment. Their investments in it are $7,000, $8,000, and even more per dealer in many cases. No one else is so well equipped to serve you.

IH PRECISION PARTS. The parts your dealer installs while repairing your IH equipment are *real IH parts*, exactly like those originally in the machine. They are *precision-engineered* . . . more than 250 men at the IH Manufacturing Reseach Center work constantly to make them even better. They are *precision-built* . . . rigid quality control is followed in every IH factory. So IH parts fit right and wear longer.

IH-QUALITY SERVICE. This IH 5-Star Blue Ribbon Certificate marks machines serviced in a shop that meets International Harvester's high standards . . . in the shop of a responsible local business man to whom it is important that your IH equipment keeps on working right, year after year. Your IH dealer is one of nearly 6,000 . . . the most complete farm machinery service network in America.

NOW'S the time to get your tractor serviced!

Why? Because you can probably spare your tractor more easily for a few days during late fall or winter than in spring or summer. And because your IH dealer's service men aren't so rushed now. They can give your job unhurried care. So call your dealer . . . ask for a service cost estimate. International Harvester Company, Chicago 1, Illinois.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Crawler Tractors and Power Units . . . Refrigerators and Freezers

INTERNATIONAL HARVESTER

"ROCKET"!

HYDRA-MATIC!

Oldsmobile has both!

The famous high-compression "Rocket" Engine—

plus new Oldsmobile Hydra-Matic Drive*!

Try this thrilling combination

at your nearest Oldsmobile dealer's!

Above, Oldsmobile "88" Holiday Coupé
**Hydra-Matic Drive optional at extra cost on all Oldsmobile models.*

OLDSMOBILE

A GENERAL MOTORS VALUE

YOU'RE THE MAN WHO KNOWS—
Which Tractor Tire Pulls Best In Your Soil . . .

SO YOU MAKE THE CHOICE

Only Firestone Has Both...

YOU'RE THE MAN who knows the soil conditions on your own farm best. For that reason, you're the man best qualified to judge which tractor tire will do the best job for you.

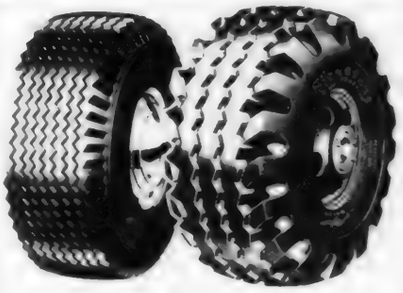
If it's the open center tractor tire you need . . . get the *new*, the *advanced open center* . . . the *Firestone Curved Bar Open Center*. It's the only open center tire with *Power Arc Traction Bars* . . . curved and tapered for extra drawbar pull, and sure, positive cleaning; the only open center tire with *Double Shock Protectors* for longer body life.

If it's the traction center tire you need, there's only one — the famous patented Firestone Traction Center. It's the tire preferred by thousands of farmers the nation over. There are more than two million in use today, because thousands of farmers will have no other tire.

Again we say . . . you make the choice, but be sure you get a *Champion* tractor tire . . . either the *Firestone Curved Bar Open Center Champion* or the *Firestone Traction Center Champion*. You don't need to shop around . . . Firestone Stores and Firestone Dealers have both tires.

Listen to the Voice of Firestone every Monday evening over NBC

Copyright, 1950, The Firestone Tire & Rubber Co.



Firestone

PASSENGER AND TRUCK TIRES ARE MONEY SAVERS ON THE FARM

Passenger cars and trucks on the farm are rolling up more mileage every year and tire cost is an important item. You can depend upon Firestone tires to give you extra, trouble-free mileage at lower cost. And remember, Firestone builds a time-and-money-saving tire for every wheel that rolls on the farm.

1½-ton shown with 12-foot grain body—also available on 2-ton chassis

This truck is built right for farm work!

ALMOST everywhere you look in a Studebaker truck, you find important improvements in design that cut operating costs.

The massive, pressed-steel Studebaker truck frame, for example, extends well beyond the rear axle for increased load protection and lengthened body life.

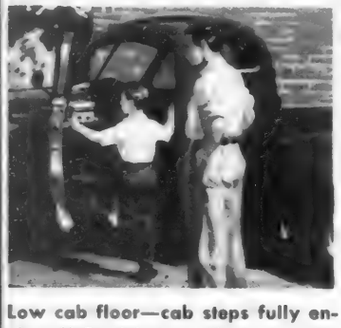
The front of the frame is reinforced with a rigid, twist-resisting, special K-member—an exclusive new Studebaker method of strengthening the whole forward structure of the truck.

Gas-saving automatic overdrive, too! Studebaker's gas-saving automatic overdrive transmission is now available in all ½ ton and ¾ ton models. It's extra cost but it starts paying its way right away in extra thrift.

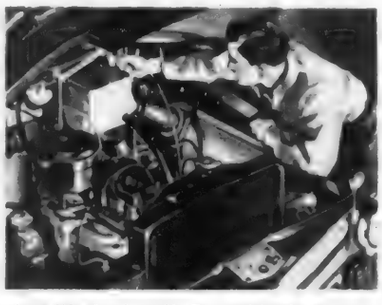
Studebaker's modernly designed Econ-o-miser and Power-Plus engines are stand-outs in horsepower and torque, deliver superb gas mileage month after month, year after year.

Stop in now and see these Studebaker trucks —½ ton, ¾ ton, 1 ton, 1½ ton, 2 ton models.

STUDEBAKER TRUCKS
Noted for low-cost operation



Low cab floor—cab steps fully enclosed! Studebaker cab doors open wide—close securely on tight-gripping rotary latches. The cab door windows have handy built-in ventilating wings.



Just lift the hood! Everything's easy to get at! No standing on a box is necessary in order to work on engine or ignition! No stooping under the dash to find instrument wiring! Everything is within arm's reach.

No roll back at upgrade stops! All Studebaker trucks are available with the famous Studebaker Automatic Hill Holder at slight extra cost. No roll back when you're ready to go forward after making an uphill stop!

Father-and-son teams are numerous among the Studebaker truck craftsmen. Their careful workmanship is real protection against costly repairs.

© 1950, The Studebaker Corp'n, South Bend 27, Indiana, U. S. A.

COMING IN WINTER

Iowa is the land of corn and hogs. But it is also a land of agricultural variety. Its farmers raise many crops and raise them well enough to make their state one of the top ranking agricultural states in the nation. In our Winter issue readers will find the story of Iowa farming, the inspiring story of how top-notch farmers in this Midwest state have made farming a big business. This will be the first of a series on farming in the 48 states.

In the same issue will appear the story of another group of thrifty farmers, the Dutch, who grow 95 bushels of wheat to the acre and fatten hogs on potatoes. A 25 acre farm keeps two Dutch families comfortably. The editor of Farm Quarterly, who lived with Dutch farmers while studying their methods, brought back the story of a skillful, thrifty people who have many ideas we could profitably use on American farms.

One of the most popular articles Farm Quarterly has ever published was "Who Sets The Price Of Corn?" Readers have asked for similar articles on other farm crops. Our Winter issue will carry a companion piece on how the prices of beef and pork are established, with special emphasis on grading beef on the hoof. Other stock stories will tell about the radiant heating of poultry houses, how a Utah sheep rancher operates, and how Brahman cattle are being crossed to produce good doers in northern pastures.

There will be an article by Dr. William Albrecht on the value of deep rooted crops, a complete story on how to test soils, and another on the advantages of deep tillage for Midwest farms.

Grass silage continues to grow in popularity among farmers and their stock, and our Winter issue brings a second article covering the fine points of making and preserving grass silage. Other crop stories are on growing corn and soybeans in the same field during the same season, and the reasons behind the growing popularity of that newly important southern crop, Reseeding Crimson Clover.

Articles in the feature section include The Morgan Horse, Starlings, which are both friends and pests, Fishing Through The Ice, and Oxen.

The first farmer was the first man and all historic nobility rests on possession and use of land.—EMERSON.

THE FARM QUARTERLY
22 East 12th St., Cincinnati 10, Ohio

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THE FARM QUARTERLY

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Contributing Editors: **Myron S. Hazen, G. N. Hoffer, Charles Krutch, C. M. Long, George D. Scarseth, Katharine A. Smith.**

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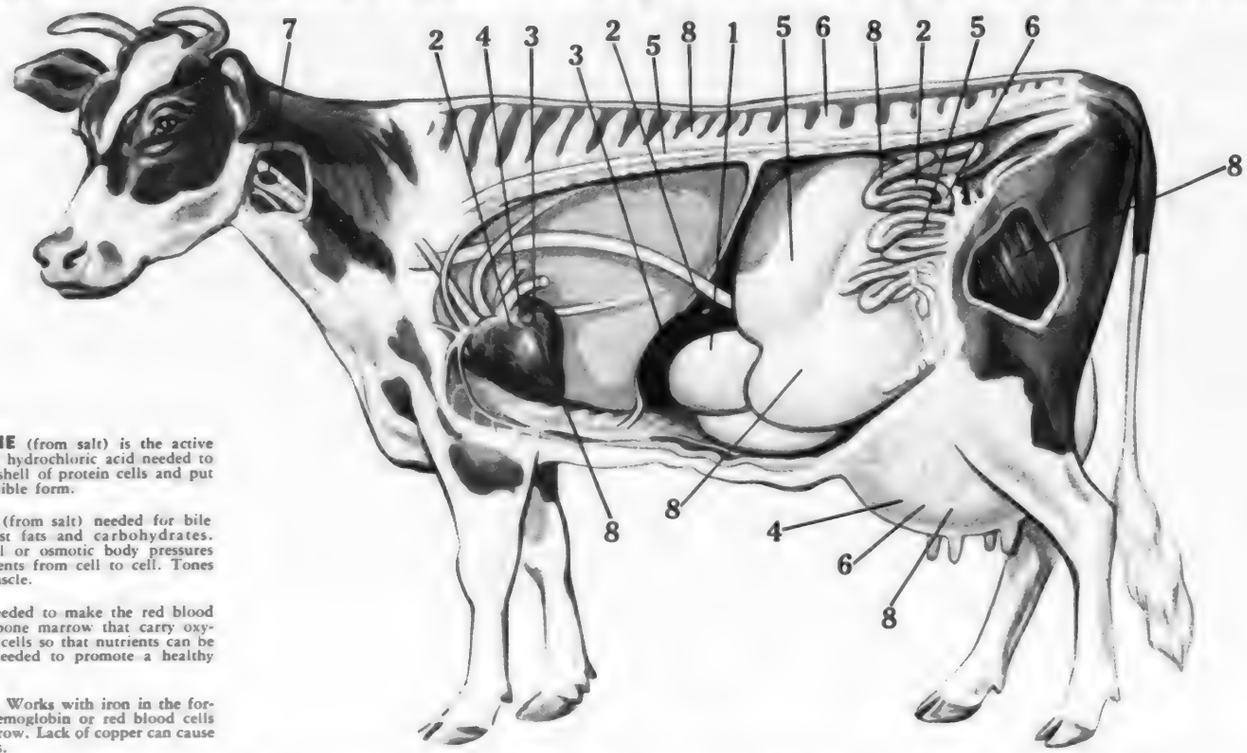
Here's why MORTON'S Trace Mineralized Salt makes Livestock Healthier, Thriftier, More Profitable



1—CHLORINE (from salt) is the active ingredient of hydrochloric acid needed to break the hard shell of protein cells and put them into digestible form.

2—SODIUM (from salt) needed for bile to help digest fats and carbohydrates. Controls internal or osmotic body pressures that move nutrients from cell to cell. Tones up the heart muscle.

3—IRON. Needed to make the red blood cells in the bone marrow that carry oxygen to all body cells so that nutrients can be utilized. Also needed to promote a healthy active liver.

4—COPPER. Works with iron in the formation of hemoglobin or red blood cells in the bone marrow. Lack of copper can cause breeding failures.

5—COBALT. Stimulates the bone marrow where blood is made. Cobalt also promotes a healthy intestinal flora which stimulates the assimilation of feed. An important part of vitamin B12.

6—MANGANESE. Needed for reproduction, big milk flow. Manganese works with calcium for sound bone growth. Like cobalt, it also sets up a healthy condition in the intestines for better assimilation of feed.

7—IODINE. Required for thyroxine in the thyroid gland which controls all bodily activities — growth, repair, reproduction, feed assimilation. Thyroxine prevents goitre or big neck.

8—TRACE MINERALS, individually and in combination, activate important enzyme, vitamin, and hormone functions. These are the basic life processes that convert feed nutrients into blood, bone, meat, milk, wool.

It's like a low-cost insurance policy covering ALL your livestock for only a few cents a day

Don't let hidden hunger cut your livestock profits. For healthy, thrifty animals . . . for profitable feeding and dairying, it isn't enough to feed your animals just the natural grasses, grains, and other forage crops.

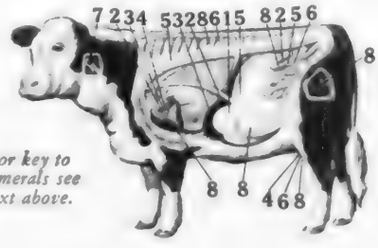
To make the best use of these feeds — to get the most good from the proteins, fats and carbohydrates they contain, livestock also need salt and trace minerals — iron, copper, cobalt, manganese and iodine.

Without the chlorine of salt to help make hydrochloric acid, there is only partial digestion of protein. Without sodium from salt to form bile, there is incomplete use of fats and carbohydrates. Without sufficient trace minerals, the enzyme, vitamin, and hormone systems function poorly, are inefficient. These basic life activities convert feed into nutrients and nutrients into growth, repair, reproduction — into blood, bone, tissue, meat, milk, and wool.

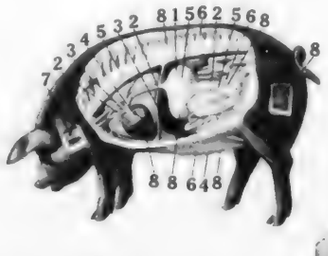
That's why when livestock are not getting sufficient trace minerals they cannot make the gains you expect. They have difficulty in breeding . . . in calving, lambing and farrowing. You lose too many suckling animals. Your feeding costs are high.

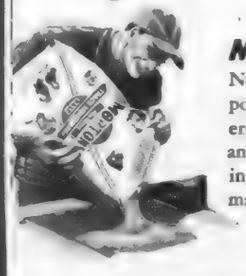
Originally Nature put sufficient trace minerals in the grains, grasses, and forages that livestock eat. But because of heavy cropping of land . . . wind, sheet, and gulley erosion, our soils are becoming deficient. Crops grown on these soils are deficient. Livestock eating those crops are likewise deficient. This is true in even the better farming areas of the country.

The simple, easy, economical way to supply the salt and trace minerals is Morton's Free-Choice Trace Mineralized Salt. Costing only a few cents more per animal per year, it is like a low-cost insurance policy that protects and assures healthy, thrifty livestock and more profitable livestock operations. Ask your dealer for Morton's Trace Mineralized Salt—feed it *free choice.*



For key to numerals see text above.



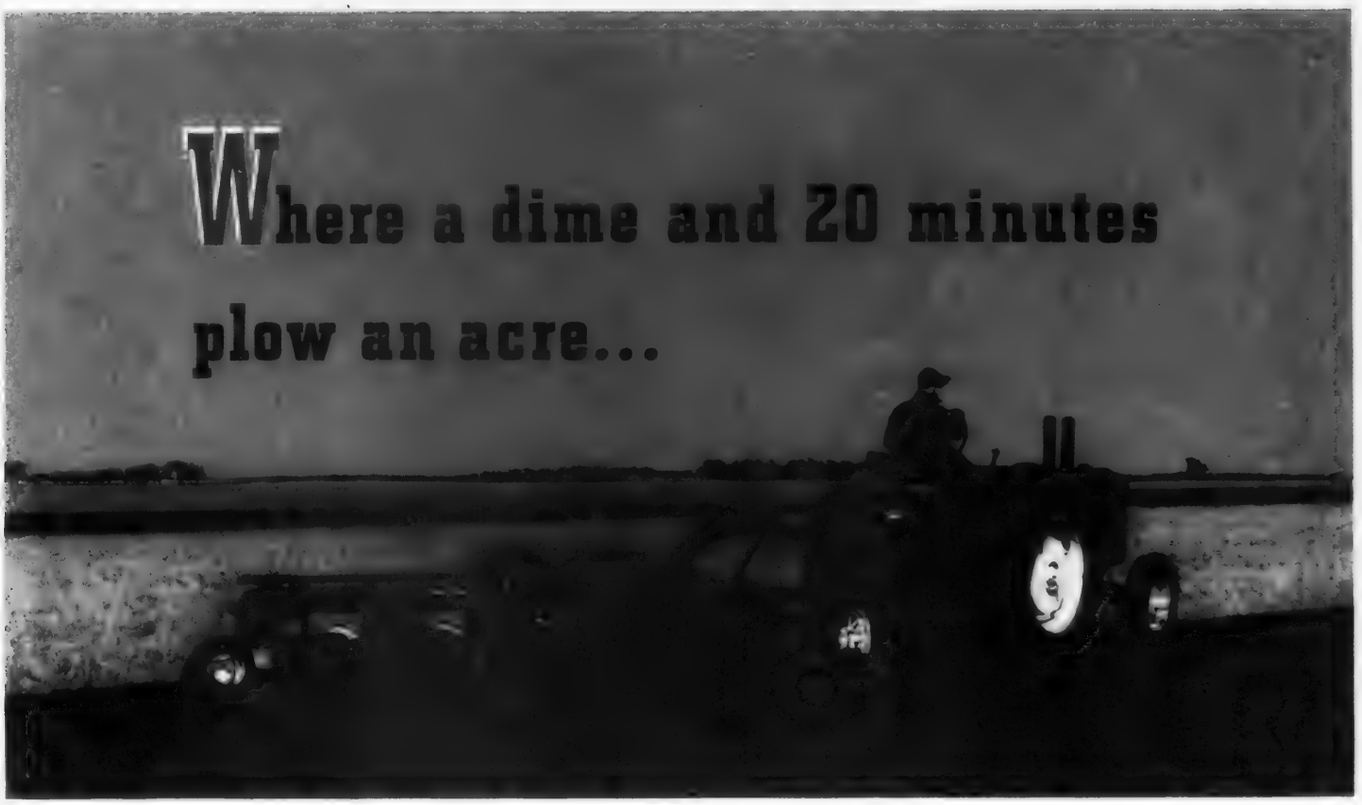


Make This Simple Test

Next to your regular salt supply, put a few pounds of Morton's Free Choice Trace Mineralized Salt. You'll be surprised how your animals relish the trace mineralized salt, showing their need for the iron, copper, cobalt, manganese, and iodine it contains.

Send for FREE Booklet and Folders

Get all the facts on feeding Trace Mineralized Salt. Write for important literature on feeding salt and trace minerals. Mailed FREE. Morton Salt Company, P. O. Box 781, Chicago 90, Ill.



Production costs fall to new lows wherever the John Deere Model "R" goes to work. From the ricefields of Louisiana to the vast wheat-growing sections of Canada . . . from the pasture lands of Florida to the Great Plains and the Pacific Northwest, this great new tractor is saving owners hundreds of dollars a year.

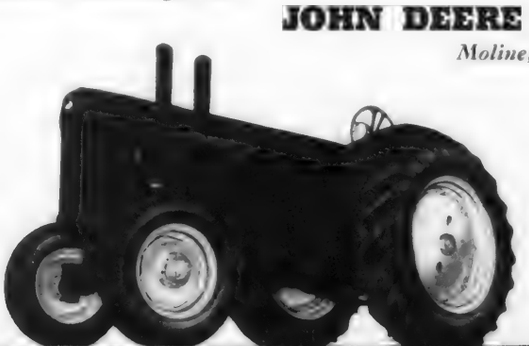
Typical of its outstanding performance is the plowing job depicted in the scene above. This Illinois farmer is *averaging more than 3 acres an hour at a fuel cost of less than 10 cents per acre.*

The Model "R" is a 4-5-plow wheel-type Diesel, John Deere-engineered through and through. Its simple, rugged engine of time-proved, *two-cylinder* design, has about half as many, twice-as-husky parts to insure lower maintenance costs, longer life. Its modern operating features include 5-speed transmission . . . hydraulic Powr-Trol . . . direct, engine-driven power shaft . . . hand clutch . . . oscillating front axle . . . individual foot brakes . . . auxiliary starting engine with self-starter and lights . . . plus extreme comfort, convenience, and ease of steering.

There's a whale of a story behind this leader of the heavyweights, and the best way to get all the facts is to see your John Deere dealer for a free demonstration. Take the wheel and let the Model "R" "sink its teeth" into a tough plowing or disking job. Test its power and fast working speeds. Check its amazing economy yourself. Compare it, feature for feature, with any spark-ignition or Diesel tractor of similar power rating. You'll want this profit-maker on *your* farm.

JOHN DEERE

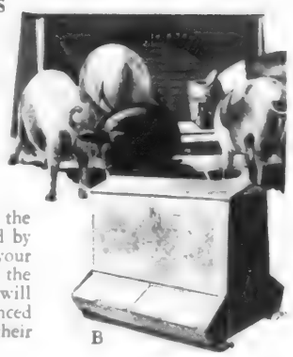
Moline, Illinois



JOHN DEERE MODEL "R" DIESEL TRACTOR

New Leader of the Heavyweights

MORE MONEY FOR YOUR HOGS THROUGH SELF FEEDING



A

B

Want to receive top prices for your hogs? Here's what U. S. D. A. Bulletin No. 1504 says: Self fed pigs gained an average of 1.20 lbs. daily as compared with an average only 0.95 lbs. per day for the hand fed lot. The self fed pigs however, required only 441.6 lbs. of feed per hundred pounds of gain, as compared with 603.9 lbs. required by the hand fed pigs. The rapid gains obtained by using Farmer Self Feeders, mean that your hogs can usually be marketed before the semi-annual rush reduces prices. You will be able to push your herds with well balanced rations and sell while prices are near their peak.

Farmer Wood Steel Clad Feeders (A) offer you the best in self feeding equipment: Kiln dried siding, heavy galvanized steel trough lids with channel divider drain, individually suspended mechanical agitators, weather proof construction. No clogging or bridging of feed. All sizes. Also available are No. 4 and No. 6 All Steel Feeders (B)

TURN YOUR WATER INTO MONEY

C

D

Water is the cheapest feed you have on your farm. Hogs on full feed, winter or summer, fatten readily. Anything fattening burns. Failure to receive plenty of good, clean water means a loss to your feeding. Keeping a fresh water supply before your hogs at all times actually effects a 15% better gain.

For year 'round use it's the Farmer VT 85 Summer Winter Fount (C). It accommodates 100 hogs, has large exposed watering surface, 85 gallon capacity. Heaters and panels are optional.

For summer use it's the Farmer Roll-A-Vac (D). Compact, no inlet or outlet plugs to cause trouble. Roll up for filling, down for operation. 85 gallon capacity.

BROADCAST SEEDING MEANS SAVING VALUABLE TOP SOIL

All over the country the talk is about soil conservation. It means cover crop seeding to retain that valuable, rich top soil. No other seeder can do the job the All Electric Farmer Broadcast Seeder does. Battery powered, it can be mounted on front or back of your tractor, sows any seed or grain that can be broadcast, up to 20 acres per hour. Provides constant width in spread and even flow of seed. No power take-off operation.

NEW PRODUCTS OFFERED BY FARMER FEEDER CO.

Farmer All Steel Gates

This adjustable angle brace all steel gate comes complete with hinges and gate chain fastener. Dipped in rust resisting aluminum for extra weather protection. Available in 10, 12, 14 and 16 ft. lengths. They are adjustable, tilt easily. Hogs cannot root these gates open.

Farmer All Steel Hog Pens

Individual units that may be hinged together, or hooked on to your hog house, self feeders, etc., to make hog pens, individual compartments or enclosures. Construction is identical to gates. Available in standard 7 and 8 ft. lengths.

Farmer Fence Anchors

The answer to costly fence repair problems. Once installed, these anchors stay put, keep your fence and fence posts securely anchored, animals safely corralled. Write for installation booklet.

Farmer Fence Post Driver

Here's the effortless way to do your fence post and shallow well driving. Drives posts and pipe fast and straight, weighs only 18 lbs. Cold rolled steel in head for driving weight. It is built for heavy duty use.

A complete new line of FREE literature is just off the press. Be sure to check folders you need on the coupon below.

Please send at once your FREE literature on the items below.

☐ WOOD STEEL CLAD FEEDERS
☐ ALL STEEL FEEDERS
☐ VT 85 SUMMER WINTER FOUNT
☐ ROLL-A-VAC FOUNT
☐ FENCE POST DRIVER
☐ ALL STEEL GATES
☐ ELECTRIC BROADCAST SEEDER
☐ FENCE ANCHOR
☐ ALL STEEL HOG PENS
☐ SALT SELF FEEDER

FARMER FEEDER COMPANY, *Inc.*
CAMBRIDGE CITY, INDIANA — MARION, IOWA

LETTERS

GRASS GOES SOUTH

Sir:

Each season ups our estimate of what grass can do here.

D. L. Holmes of Johnston carried the 200 Hereford heifers, that he recently sold, through the winter on 50 acres of crimson clover and rye grass. Four cows to the acre, and they couldn't keep it down!

Yes, such things are happening down here in what used to be called the "short grass section." And they are more significant than the discovery of gold would have been. For gold is soon exhausted. But such a potential as we are finding in the land never goes. It is a quite recently discovered part of our heritage.

Yes, gold is a product of chance, and it shows up at a few places, reflecting small credit to the lucky one. But the undeveloped resources of our soil are there for the man who applies the know-how of science.

J. M. Eleazer
Clemson, S. C. — Extension Specialist

WHO'S PULLING?

Sir:

Just a few lines to let you know that we enjoy your magazine very much. It's a good clean magazine that does not have to be censored before children get to it.

But one picture I won't let go without protest. The Missouri mule

where the man is leading him out of the barn and pulling; the other man is inside doing the same. The mule looks different when he pulls back. I've been on one end of the rope many a time. Would like to take a board from the barn and see what the man inside looks like.

Newton, Kans. — J. B. Wielve

Maybe those reins are a little taut. Ed.

CAN YOU MAKE BUTTER?

Sir:

Can anyone tell me how to make butter that is just as good as the best store-bought varieties? (Please do not refer me to Gov't. bulletins; I already have them.)

My problem is not *how* to make butter; it is very easy to make. My problem is how to make butter that does *not* have an offensive odor and taste.

I have tried everything told me by my farmer-neighbors . . . "let your cream stand in a warm place" . . . "let your cream stand in a cool place until only *slightly* sour;" "work out *all* the buttermilk" etc., etc. Nothing works, the butter still has a rank, stale odor.

There must be a trick to it that the commercial dairies use in the making of their butter and in the production of their buttermilk.

In a recent issue of the "Farm Quarterly" I read that the "Irish housewife takes great pride in her home-made butter." I wish I could say the same.

New Bloomfield, Pa. — M. Shotwell

Would reader Shotwell please turn to page 78?

(Continued on page 14)

Hundreds of Farmers are Planning Now to Build These Modern Farm Buildings with REYNOLDS *Lifetime* ALUMINUM

CORRUGATED 5-V CRIMP

WEATHERBOARD SIDING

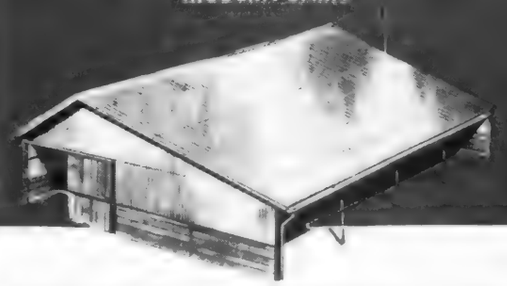
GUTTERS AND DOWNSPOUTS

From up and down the farmlands of America, there has been a tremendous response to the new building plans offered by Reynolds Farm Institute. It's proof that farmers *want* these modern, low-cost, work-saving structures, built with the modern labor-saving material: aluminum.

Farmers want aluminum because it is rustproof, needs no painting, resists fire and vermin... and reflects radiant heat so buildings are cooler in summer, warmer in winter, increasing poultry and livestock production. They want Reynolds *Lifetime* Aluminum because Reynolds offers high-strength roofing and siding in both smooth and stipple-embossed finish... plus aluminum nails and complete accessories... plus half-round or ogee gutters and downspouts. Also aluminum-surfaced roll roofing and reflective insulation.

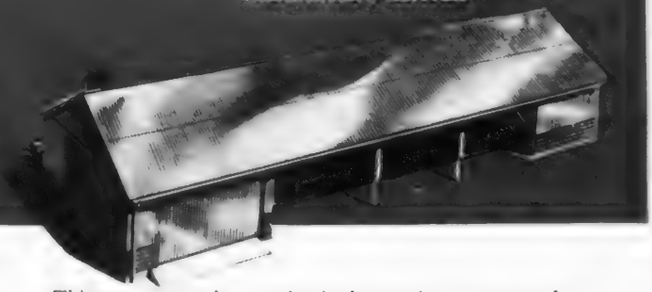
Get started with *your* plans. Mail the coupon. Meanwhile, see your building supplies dealer. **Reynolds Metals Company**, Building Products Section, Louisville 1, Ky.

Plan to Build This LOW-Cost MODERN BARN



Build it at half the cost of a conventional barn. It cuts in half the labor of handling feed and livestock. Designed and tested by Doane Agricultural Service. For more information check coupon. For detailed building plans, from Reynolds Farm Institute, send $5.00 with coupon.

Plan to Build this complete "MACHINERY CENTER"



This new concept in a mechanized operations center can be built at half the cost of an ordinary machinery shed. Developed by Doane Agricultural Service, detailed plans and directions for construction are made available by Reynolds Farm Institute. Check coupon for more information, or send $5.00 for complete plans.

Reynolds also serves the farmer with Aluminum Cable (ACSR) Portable Irrigation Pipe, Siphon Tubes, Paint Pigment and Freezer Foil.

FARM INSTITUTE

For Building Plans of Machinery Center or Barn, send $5.00 with coupon. Or check coupon for FREE DESCRIPTIVE LITERATURE.

Note the "Aluminum Adaptor Plan" offer—it's for use with any U. S. Dept. of Agriculture drawings. And you'll want that 8-page catalog!

Reynolds Metals Company
Building Products Section, Louisville 1, Kentucky

REYNOLDS FARM INSTITUTE, Box 1800, Louisville 1, Ky.-FQ-3

Please send me ☐ FREE 8-page catalog of Aluminum Farm Building Products ☐ FREE "Aluminum Adaptor Plan" ☐ FREE literature on Machinery Center ☐ FREE literature on Labor-saving Barn

☐ I enclose $5.00 (check, cash or M.O.) for full set of Doane Pole-Frame Barn plans

☐ I enclose $5.00 (check, cash or M.O.) for full set of Machinery Center plans

Name_____

Address_____

The NEW FOX Forage Master

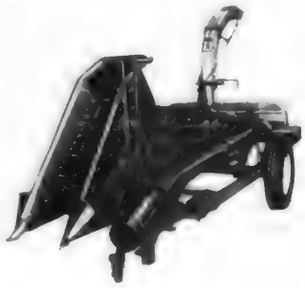
with the QUICK CHANGE Harvesting Units!

Only in the FOX

The new FOX is 700 lbs. lighter, 18" shorter, yet it has greater capacity, greater strength and many new features.

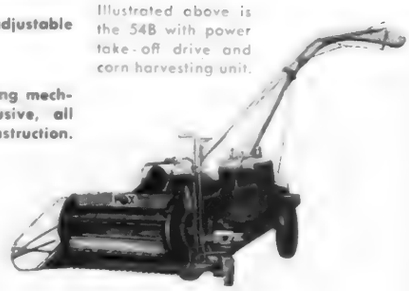
. . . can you change to pick-up, mower bar or corn harvesting unit in less than 10 minutes. The new FOX is the result of more than 20 years' experience in manufacturing pick-up hay choppers. It has many special features not found in other forage harvesters. Outstanding among these features are:

- Safety cutting principle—positively protects machine against damage by stones or other foreign objects.
- Easily and accurately adjustable cutting bar.
- Quick-change knives.
- Perfect alignment of cutting mechanism assured by exclusive, all steel, one-piece frame construction.
- Large oversize tires.



Illustrated above is the 54B with power take-off drive and corn harvesting unit.

★



The pioneer grass silage harvester with a 5 ft. mower bar and individual power unit.

FREE WRITE TODAY FOR NEW 1950 CATALOG.

FOX RIVER TRACTOR COMPANY

The Pioneer of Modern Forage Harvesting

590 North Rankin Street

APPLETON FOX WISCONSIN

The Poultry Yard

A REVIEW OF FACTS AND FINDINGS CONCERNING MANAGEMENT OF THE POULTRY FLOCK AND THE USE OF POULTRY REMEDIES.

Quick Chicks With Amino Acid

Dimethionine will make poultry grow larger in a shorter time. This new drug was discovered by research workers during World War II who were searching for some way to speed the recovery of wounded soldiers. After many disappointments, the scientists found the answer to their search in some of the amino acids—the building stones of all proteins, found in food and feedstuffs. One research team, using chickens in its early experiments, discovered that a synthetic product, dimethionine, which is a close relative of the amino acid methionine which occurs in grain, was a valuable wound healer and also a poultry growth stimulant.

Birds, they found, grew faster and larger when a small percentage of the drug was added to their daily diet. If dimethionine was not fed, and if the natural methionine was removed from their feed, they died. The high price of the new drug and the very limited quantities available during the war years prohibited its practical use. Additional research was necessary to overcome production difficulties.

ONE POUND of dimethionine to a ton of feed speeds chic growth.

Recently, Dow Chemical Company announced large scale production of dimethionine at a quarter of its former price. Since only one to two pounds of the synthetic amino acid are needed for each ton of feed to assure 10 per cent larger chickens, this new chemical may prove to be a boon for the broiler raiser.

Hormones Tenderize Tough Old Roosters

Stilbestrol, a female sex hormone, can make old roosters feel and act and, what is more important, even taste like young pullets. The hormone, called an estrogen by scientists and Capette by its commercial producer is prepared in the form of a pellet which is implanted under the skin of the rooster usually in the region of the neck or behind the ear. The pellet is absorbed over a period of four or five weeks and, during this period and for a short time thereafter, causes the old fellow to become quite henlike. He loses his fighting spirit, his comb shrinks, fat layers are deposited in his body and his flesh becomes tender and improves in flavor.

The hormone does not caponize the bird: shortly after he has finished absorbing the pellet he will start to regain his masculinity. The pellets work best with old birds. It is debatable whether it is economically advantageous to use them on cockerels; on tom turkeys they seem to be least effective.

Hormone-treated birds should not be slaughtered until a few days after all the stilbestrol has been absorbed: otherwise it may have an unwanted estrogenic effect upon the consumer. This effect was disastrously illustrated on a mink farm this year. The farmer had arranged to secure chicken heads to feed his mink. Enough of the chickens heads still contained stilbestrol to cause the male mink to lose all interest in family life. Instead of breeding like mink, the farm produced not a single baby during the season.

GET PLANS NOW FOR THIS BETTER KIND OF BUILDING!

• Simpler to build • No painting • Brings better yields

Millions of squares of Alcoa Aluminum Roofing and Siding have been applied with outstanding results. But now—for the first time, you can get low-cost plans for buildings *designed for the use of aluminum.*

What does this mean? It means simpler construction. Easier building. No painting—ever. Yet these buildings are rot-proof, vermin-proof and are much cooler in summer, warmer in winter.

Agricultural Engineers of the University of Illinois have applied Aluminum Roofing and Siding to the development of designs for farm buildings.

Ready now are plans for a 200-bird Poultry House—a modern, efficient building for the farm flock; coming next, a Utility Building that can be easily adapted for use as a Machinery Shed, Livestock Shelter, or other general farm use. Other plans are in preparation.

There's plenty of evidence that Alcoa Aluminum is the best roofing and siding material farmers have ever used. "My poultry house is much cooler inside," says one poultryman. "I lose far less chicks in hot weather," says another. "My hogs will pick the aluminum-roofed farrowing houses every time" . . . "Hens will stay in my aluminum-roofed range shelter on hottest days, instead of seeking shade elsewhere," others tell us.

With the right plans, and the best, most modern roofing and siding, you're bound to come out with the most efficient buildings you ever saw.

Mail the coupon today. ALUMINUM COMPANY OF AMERICA, Pittsburgh 19, Pennsylvania.

BETTER BUILDINGS FOR BETTER FARMING

FOR ALL RE-ROOFING and SIDING JOBS—ALCOA SHEET IS YOUR "BEST BUY"

JOHN C. KICK'S entire roof was laid between 9 AM and 4 PM in one day! He says, "No leaks in heavy storms—15° cooler inside!"

JOE MIKA, Desputanta, Va., says, "My team cools off quicker, eats better under this Alcoa Roof. It's strong and easy to work."

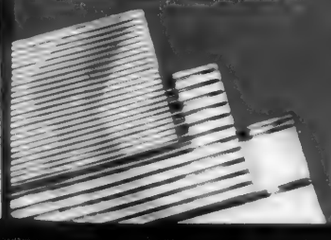
"This roof on my milk parlor has given excellent service for four years. Building is cool on hottest days. Cows are more comfortable," reports Ellis W. Wampler.

NEW LOWER PRICES!

Get the figures from your Alcoa Dealer, compare costs of Alcoa Aluminum Roofing with other metal roofing. See how Aluminum can help you save on first costs as well as eliminate paint and upkeep costs.

SEND FOR PLAN SETS TODAY

ALCOA ALUMINUM ROOFING SHEET



ALUMINUM COMPANY OF AMERICA
1452J Gulf Building, Pittsburgh 19, Penna.

☐ I enclose 50c (coin). Please send me plans for the Poultry House.

☐ Send me free application instructions.

Your Name_____

Address or RFD_____

State_____

My dealer (name)_____

(address)_____

"Seven Inches...*that's all!*"

Yes, just seven inches of life-giving topsoil covers the land — all that remains to provide the world's supply of food and fibre products. And *less than half* of the earth's soil is suitable for crop production.

Our standards of living — and perhaps human existence itself — depend upon the wisdom with which we manage this remaining seven inches of topsoil — on how its productivity is maintained and even increased. One way to achieve increased productivity of the soil is through the use of improved higher analysis pelletized fertilizer.

Mathieson is now producing several grades of *higher analysis fertilizer in pellet form.* These improved fertilizers are already making important contributions to better land management, increased soil fertility and higher yields per acre. But this is only the beginning. Mathieson is also working in close cooperation with agricultural leaders toward the development of more and more grades of improved higher analysis, pelletized fertilizer. Several new grades under development will soon be ready to help increase the fertility and productivity of this vital seven inches of remaining topsoil.

Ask your agricultural advisor about the advantages of high analysis fertilizers. Get acquainted with your Mathieson dealer. You'll find him eager to help you get the best value ever from your fertilizer investment. Mathieson Chemical Corporation, Mathieson Building, Baltimore 3, Maryland.

Mathieson
CHEMICALS

SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

THE FARM'S PICTURES

STAFF PHOTOGRAPHER Joe Munroe at work on photographing *Beef Bull Testing*, p. 40.

Cover by Harold M. Lambert Studios

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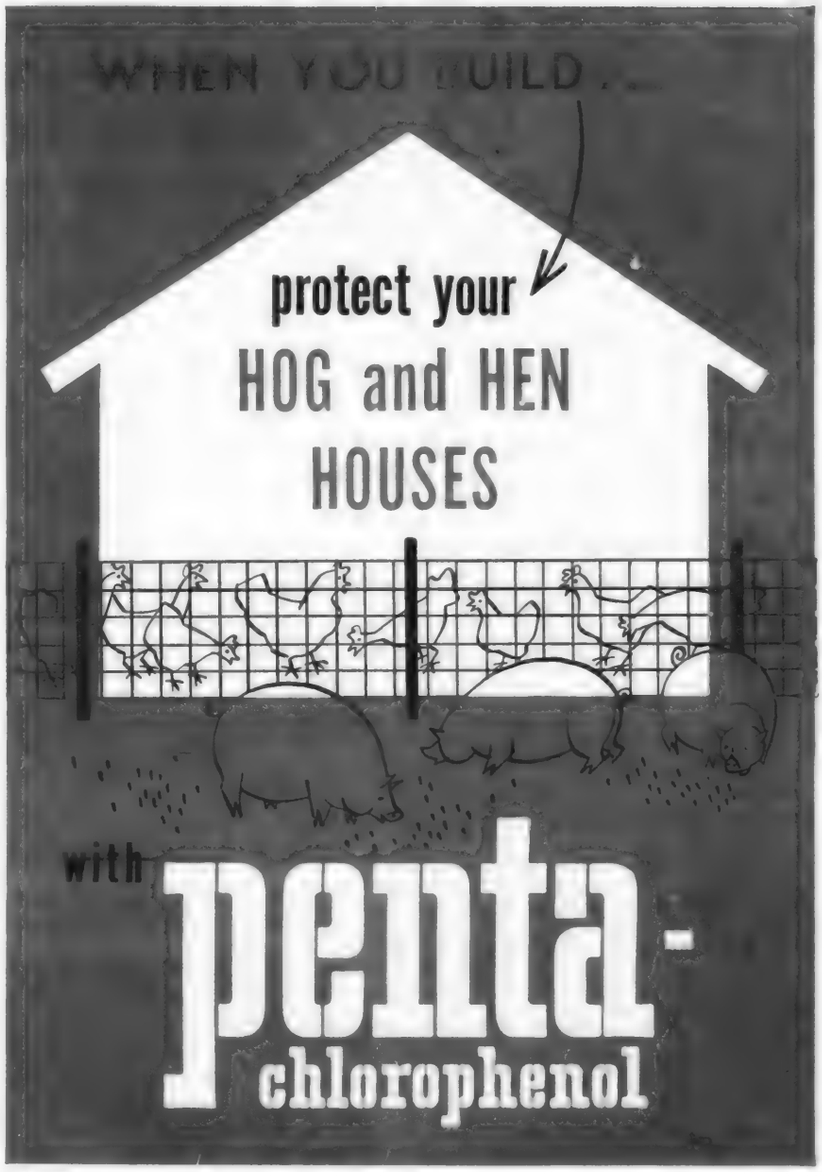
THE AUTHOR of *The Longhorn*. Because C. Faye Bennett's article on the longhorn completely filled its allotted pages we have moved the customary authors biographical note to this position. C. Faye Bennett, wife of a Tulsa, Okla. oil man, is a prolific writer of poetry, magazine articles, and nature fiction. She is no newcomer to Farm Quarterly. Back in 1947 she wrote about the Brahman cattle of Texas and Florida. Her interests center about livestock, especially cattle, about which she writes so well.



★ EASY TO USE ★ CAN BE APPLIED COLD
★ DRYS QUICKLY and LEAVES WOOD CLEAN

The health of your animals is important! Protect them with strong, efficient hog and hen houses built of PENTA-PROTECTED wood.

Wood treated with PENTA is safe from termites and decay. It lasts 2 to 4 times longer than untreated wood, saving you repair time and money in the long run.

Wood flooring, roofing and foundations especially need the clean, lasting protection of PENTA.

You'll be smart to protect your hog and hen houses, barns, and fence posts with PENTA.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

SEND TODAY for free literature that tells you how to treat fence posts, barns, and hog and hen houses.

The Dow Chemical Company
Dept. PE 55
Midland, Michigan

Tell me more about PENTA and its use in
☐ BARNS ☐ FENCE POSTS ☐ _____

Name _____

Address _____

City _____ State _____

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penta
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LETTERS (Continued from page 8)

SERVICE TO THE BLIND

Sir:

As you know, I have been performing a humble service in behalf of the blind. My limited experience taught me this: that the public is frequently not aware of the opportunity which they have of services to the blind, and also in respect to the accomplishments of the blind.

You have performed a splendid service in your article on the blind farmers (Summer 1950). I feel certain that, as a result of this article, there will be an increase in the responsiveness of the people, generally to blind persons, to carry on the work which we are doing. We know that we must rely on the responsiveness of people in order to continually expand our services.

Cincinnati, Ohio — Wm. Beiser, President
Cincinnati Assoc. for the Blind

SORRY, WRONG COUNTY

Sir:

The article Vigo Wheat (Summer 1950) states that Abraham Fultz, a Lancaster, Pennsylvania farmer found three heads of smooth wheat in his field of bearded Mediterranean wheat.

Abraham Fultz, whom I knew personally, lived in the Kishacoquillas Valley in Mifflin Co., Penna. and found the wheat heads while cradling in a field in the adjoining county of Huntingdon.

Abraham Fultz's son, J. Earl Fultz, is living at Mt. Union, Pa., and his grandson, Russell Fultz, principal of the Mt. Union grade schools, lives at the same address.

Huntingdon, Pa. — Ray F. Brown

FARM QUARTERLY AND 58 ACRES

Sir:

You've got a new subscriber. Enclosed is my check for three years. The truth of the matter is I've been buying some copies of *Farm Quarterly* at the newsstand and my sister-in-law has been giving me a few. I look forward to them but I never seem to know when they come out, so now I've made it easier for both of us.

Two years ago this summer my wife and I bought 58 acres of land of which about 25 can be farmed. I've learned a lot in the last year or so, and I must confess that I've gotten about 95 per cent of my education as a farmer out of the *Farm Quarterly*.

The reason I like your magazine is that it is written in a manner that a beginner like myself can understand and it does not skip a lot of details that only a seasoned farmer can understand. I hope you continue to publish it that way.

Uhrichsville, Ohio — Joseph DiNatale

THANKS ARTHUR

Sir:

Enclosed is $2.00 for *The Farm Quarterly*. I have heard Arthur Godfrey talk of it so much on the radio and finally he told us where to get it.

Tucson, Ariz. — Gladys Meacham

Sir:

I just heard Arthur Godfrey talking about your magazine and by a coincidence I was reading same. Everything he said about it is true.

I enclose my check to cover one year subscription.

Asheville, N. C. — Carlos M. Ruiz

Sir:

Enclosed please find my personal check for $5.00 for three years of your magazine. I've been wanting to become a subscriber since seeing your first copy but, you know how it is.

Just now, Arthur Godfrey was telling his listeners about it and, smart cookie that he is, gave out your address which I've been wanting. Wonder how many of Godfrey's listeners are sending in.

Wooster, Ohio — Mrs. Alice B. Pendleton

These letters were picked from a large stack of similar ones received after Arthur Godfrey's mention of Farm Quarterly. Ed.

SAVE your BACK!

SAVE TIME!

with the famous 4-in-ONE

HARVEY "RED-HED" FARM ELEVATOR

Handles Everything!

Why break your back during crop storage time! Why leave your crops to the mercy of the weather because you haven't time to handle them . . . when the revolutionary, fast, versatile Harvey "Red-Hed" Farm Elevator will do the job for you. Think of it . . . one elevator . . . one investment . . . will handle all crop storage from small grain to big bales of hay due to its 4 position, easily adjusted sides. It moves easily . . . easy to operate . . . sturdily constructed throughout including an extra tough, long lasting roller chain . . . folds up for storage in a 20 foot shed. Why not see your Harvey dealer today!

Harvey RACINE LINES

Set Sides to 4 Positions

Full open . . . for baled hay, boxes, . . . and similar bulky material.

½-open for ear corn, vegetables, etc.

⅓-open for bags of grain, tankage, etc.

Closed for small grain, shelled corn, beans, etc.

with HARVEY "RED-HED" CORN SHELLER — 42% More Shelling Area with Patented KERN-O-LIZER

Here's a corn sheller that quickly pays for itself in more bushels of corn per hour. Shells 140 to 150 bushels per hour . . . does not choke in fast feeding . . . does a cleaner job . . . pushes cobs and husks toward discharge . . . it is the greatest corn sheller ever built.

SAVE MONEY!

with Harvey "Red-Hed" Hammer Mills

1 3 more grinding per Horsepower Hour

How would you like to make 4 bushels of feed equal 5 in feed value? You can do it with a Harvey Hammer Mill. Built by Farm Tools, Inc., you know from experience it will do a good job of saving time and money for you.

MAIL THIS COUPON TODAY!

FARM TOOLS, INC., Mansfield, Ohio

Send me complete information on the time and money saving Harvey Farm Elevator, Corn Sheller and Hammer Mill.

Name _____

Address _____ R.F.D. Route _____

City _____ State _____

Built by FARM TOOLS, INC., your old friend in the farm implement business

AVOID FALL DROP IN MILK PRODUCTION ...Feed

At least one month before your cows are taken off pasture, start feeding Tuxedo Dairy, gradually increasing the amount to full feed. If they have been on a small amount of Tuxedo Dairy all summer, this operation will bring even better results.

Along with the necessary minerals, carbohydrates and proteins, Tuxedo Dairy supplies Vitamin D, the "sunshine" vitamin, in which even sun-cured roughage is often seriously deficient.

Tuxedo Dairy is also fortified with Wheat Germ Oil, one of the richest natural sources of Vitamin E, so necessary in reproduction.

Tuxedo Dairy is supplied in five different protein contents—16%, 18%, 20%, 24% and 33%. See your Tuxedo Dealer.

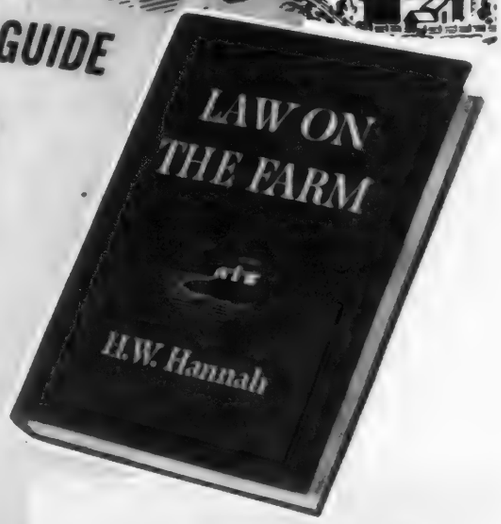
TUXEDO Dairy

THE EARLY & DANIEL CO., CINCINNATI, OHIO • EST. 1881

GIVEN...THIS INDISPENSABLE GUIDE TO LEGAL PEACE OF MIND ON THE FARM

WITH MEMBERSHIP IN THE NEW

FARMER'S BOOK CLUB



NO FARM can afford to be without the insurance against worry, loss and costly mistakes which this book provides. H. W. Hannah, the author, is a well-known authority on farm law, and his book, the first of its kind, tells in simple, easily understood language what your legal rights are in hundreds of common farm problems. Whenever you have questions on the purchase of land, water rights, trespass, contracts, taxation, tenancy, depredation by neighbors' animals, expropriation of your land by the state, and others, you can turn to this book for the complete, up-to-date answer. The publisher's price of LAW ON THE FARM is $4.50. You may have it *absolutely free* if you decide to join the FARMER'S BOOK CLUB now.

A Special Book-Club Service for Every Friend of the Land

Overwhelming response to the Club's first announcement in the Farm Quarterly's Spring issue confirms the widespread need for this practical, new service. Now, for the first time, you may receive, through membership in the FARMER'S BOOK CLUB, your choice of the best books on every important phase of farming and farm life . . . *and at substantial savings!*

Thousands of intelligent, progressive farmers have discovered that books are as important on the farm today as the latest farm implements. They have found that the dramatic achievements of modern research in agricultural and allied fields, reports of experimenting going on all over the world, and the pioneer work of experts on farm problems are given their best and most useful expression in books. Selecting the best of these books and bringing them to the attention of busy farm families is the practical purpose of the FARMER'S BOOK CLUB. And through the club, farmers are now able to buy these books at a substantial saving. (They are also tax deductible.)

How Membership Benefits You — None of the books offered by the FARMER'S BOOK CLUB will contain information that could be obtained just as well from government bulletins and farm journals. They will be selected from the new books of *all* publishers — books of authority which blaze new trails to easier, better ways of increasing farm income . . . books to make country living as rich and satisfying as any other way of life . . . practical, readable, down-to-earth books that will be worth to you, your family and your farm associates many times their small cost.

How the Club Operates—It costs nothing to join the FARMER'S BOOK CLUB. Simply fill out and return the coupon below. By return mail you receive, as a gift, a copy of *Law on the Farm*. You receive the Club's bulletin, "Books on the Farm," giving you advance reviews of forthcoming selections, and news of other important, but more specialized, farm books on everything from breeding Angus cattle to raising zinnias. Six selections, one every *other* month, will be offered to you each year. You have your choice of four of these—*at less than publishers' prices*—and may reject a selection *before or after* receiving it. For every four selections you accept, you receive a *free bonus book.*

Accept a Trial Membership NOW — Here is the one book club designed to serve your general and special farm interests . . . one from which you can be assured of getting real satisfaction and practical help. There is no better way to build the best farm library obtainable—and at great saving! Send in the enrollment coupon TODAY.

CHOOSE EITHER OF THESE OUTSTANDING BOOKS AS YOUR FIRST SELECTION

WEEDS, GUARDIANS OF THE SOIL
By J. A. Cocannouer

An epoch-making book in that it dispels the popular notion that weeds are helpful only for the exercise needed to uproot them. This revealing, illustrated book—the result of years of intense study by a well known agronomist—shows how intelligent controlled use of weeds can add new vitality to the soil. Reg. Price $3.00. Price to members $2.40.

TREE CROPS
By J. Russell Smith

One of the finest farm books we have ever seen. Sound, interesting, and beautifully illustrated, it tells how to use non-productive land for a variety of tree crops—for fodder, fertilizer, and for cash. A practical and entertainingly written book, it is sure to become a favorite on your library shelf. The publisher's price is $6.00. Members may have it at the Club price of only $4.75.

Mail this Coupon Today!

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A Division of the Devin-Adair Company, Publishers
23-25 East 26th Street, New York 10, N. Y.

Please send me a free copy of LAW ON THE FARM and enroll me as a member of the FARMER'S BOOK CLUB beginning with the selection I have checked:

- ☐ WEEDS, GUARDIANS OF THE SOIL ($2.40)
- ☐ TREE CROPS ($4.75)
- ☐ Both books for $6.75

I will receive the Club's bulletin, "Books on the Farm" giving advance reviews of selections which I may accept or reject before or after receipt. I agree to accept four of the six selections a year and may terminate my membership any time thereafter.

NAME.....
(PLEASE PRINT)

ADDRESS.....

CITY.....ZONE.....STATE.....

My special farm interests are.....

.....

MORE SUNLIGHT and WARMTH next winter

with SELF-insulating windows of THERMOPANE

You know how good the winter sun can feel coming in through a window. It pours heat into your house and other buildings . . . can be a big factor in making your home cheerful and more comfortable, and in making your service buildings warmer and drier. So, open your buildings to sunshine with generous areas of glass. An important step in keeping heat indoors is the use of insulating windows. That used to mean putting up and taking down storm sash—a time-consuming, tiresome job every fall and spring. Not any more . . . not if you install *Thermopane** insulating glass in your windows. *Thermopane* makes windows self-insulating because it is double-glass—two panes with dry air sealed between them. You leave it in all year.

FOR YOUR HOME—*THERMOPANE MADE OF PLATE GLASS* Ground and polished for maximum freedom from distortion. It's the quality you'll want for clear views through your home windows.

FOR SERVICE BUILDINGS—*THERMOPANE MADE OF SHEET GLASS* The same insulating qualities as plate glass, but more economical to use where vision is not of prime importance. Made of finest quality sheet glass.

. . . For your home

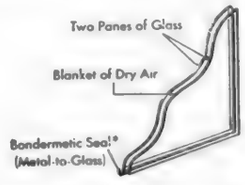
Thermopane in your home gives you greater comfort. It saves fuel. And because its room-side surface stays warmer, steam and frost are far less likely to form. Your windows stay clearer in cold weather.

. . . For service buildings

Thermopane windows are proving their worth in barns, milk houses, poultry houses and farrowing pens. *Thermopane's* insulating qualities permit the use of larger windows to bring in more sunlight. That means added warmth and dryness—two essentials for health of livestock and poultry. *Thermopane* helps keep heat inside buildings. Less animal energy goes into heating the building—leaving more energy to produce milk, eggs and meat.

Before cold weather strikes, find out what *Thermopane* can do for your home and service buildings. Talk to your Libbey·Owens·Ford Distributor or Dealer. For more information on the use of *Thermopane* in farm buildings, and for the name of your nearest L·O·F Distributor, write us.

Thermopane is made in more than 80 standard sizes, as well as special sizes, for use in all types of windows. It is sold by glass and building supply distributors and dealers. *®



L·O·F GLASS

Thermopane

MADE ONLY BY LIBBEY·OWENS·FORD GLASS COMPANY
3195 Nicholas Building, Toledo 3, Ohio

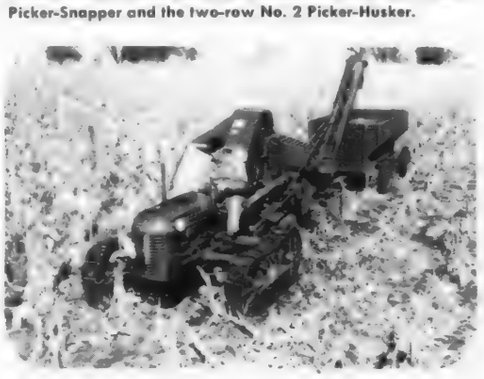
Save that "Down" Corn with an OLIVER Picker!

It's the extra ears you save that count! Whether high and dry on a tall, heavy stand . . . or on stalks that have "hit the dirt" with the onslaughts of borers and wind, you can depend on an Oliver picker to snare the hard-to-get ears.

"Live" snapping roll extension points and gathering chains work close to the ground. Wide "floating" shields follow the contour of the row, nose under "down" and tangled stalks.

Call on your Oliver dealer before fall. Get the full facts before you buy any picker. Check the many Oliver picker advancements, too. For example, the new, modern Oliver No. 4 tractor-mounted Picker-Husker is balanced over the rear tractor wheels. There's no forward overweight to bog down the front wheels in soft fields. Turning radius is extremely short . . . steering is exceptionally light. And, it's equipped with combination rubber and steel rolls that husk *clean* under widely varying conditions.

There's an Oliver picker to meet your exact corn harvesting needs. Shown here is the No. 5 single row trailer-type Picker-Husker. Other pull types include the single row No. 5 Picker-Snapper and the two-row No. 2 Picker-Husker.



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Please send me illustrated folder on the ( ) *new No. 4 mounted Picker-Husker,* ( ) *No. 5 Picker-Husker,* ( ) *No. 5 Picker-Snapper,* ( ) *No. 2 two-row Picker-Husker.*

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I farm.....acres.

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MINRALTONE HELPS BUILD CHAMPIONS

Here's Crescent Beauty Lady Gloria, All-American Three-Year-Old Heifer of 1949. She's also First Prize, Senior and Grand Champion at the National Cattle Congress, first and Reserve Grand Champion at the International Dairy Exposition, first in open class and Wisconsin Champion Cow at the Wisconsin State Fair, Grand Champion and first for Best Uddered Cow at Waukesha Dairy Show — all in 1949.

Crescent Beauty Holsteins
Protected Against

HIDDEN HUNGER*

Crescent Beauty Farm, Ft. Atkinson, Wis., is the home of Allen Hetts' famous Crescent Beauty Holsteins, well known for their excellence — particularly Crescent Beauty Lady Gloria.

Mr. Hetts, owner of the Farm, has been feeding MinRaltone regularly for more than three years. "My entire herd is fed MinRaltone," says Mr. Hetts. "We premix it, to protect them from mineral deficiencies and to help maintain peak condition and reproduction. Our results have been consistently good."

What MinRaltone will do for one breed, it will do for all. Follow the lead of successful stockmen — feed MinRaltone regularly, year round. MinRaltone protects against Hidden Hunger* because it contains 11 essential mineral elements with Vitamin D. Write for free MinRaltone feeding booklet and complete details.

NEAR'S FOOD CO., INC. • BINGHAMTON, N.Y.
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*HIDDEN HUNGER — Lack of essential mineral elements needed by livestock for sturdy health, rapid growth, peak production and reproduction.

NEAR'S
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HEALTH - PRODUCTION - PROFITS

The next issue of
THE FARM QUARTERLY will be on the newsstands
December 6th
Tell your dealer to hold a copy for you.

DAIRY BARN

They Milk In The Field

The daily chore of milking has frightened many a would-be dairyman into less demanding types of farming. Many a man has dreamed of a dairyman's heaven where the milking was done by the cows themselves. The resourceful Dutch haven't quite accomplished that, but they've partly solved the problem that ties the dairyman to his barn every day of the year.

A group of five neighboring farmers near Adouard, Holland, decided to pool their resources at milking time. They worked out a system that frees them from the twice-a-day chore at a cost lower than if they did their own milking.

In spite of a deep-seated preference for hand milking the five farmers turned to mechanical milkers. They bought a Jeep and mounted piping and taps around the car as connections for a set of six milkers and attachments. The engine creates a vacuum of 16 inches which is ample for milking six cows at once. This outfit drives from one farm to the other twice a day and the two-man crew handles all of the milking chores on each farm.

One crew member washes the udders, attaches the milkers to the cows, takes them off, and empties the milk pails. The other man, who supervises the milking, checks the machinery, keeps records, and keeps an eye open for cows in heat. If the farm can supply a third man he ties up the cows and does the stripping, in case the farmer prefers hand stripping. This crew and equipment milks 130 cows twice a day.

The equipment is washed after each milking, and once a day it goes to the dairy plant where all equipment is steam sterilized. On the trip to the plant the milk is hauled, cutting transportation costs. The system meets Holland's most rigid sanitation requirements. During the summer months much of the milking is done in the pasture fields.

The owner of these cows doesn't worry about milking.

Farm economists have investigated the money aspect of this practice and figured the comparative costs of labor, equipment, fuel, water, insurance and depreciation for both the cooperative plan and the individually milked herd .Their figures showed that while the five dairy farmers who started the cooperative now milk their 130 cows for $4211.00 a year, their total combined costs were they to do their own milking would climb to $4776.00. But the big advantage, of course, is the dairyman's freedom from the tyranny of the morning and evening chore.

The milk tester, who checks most large herds in Holland 13 times a year, likes the cooperative milking plan. Instead of spending 24 hours with each herd he can travel with the milkers and check five herds in one day.

Dutch farmers have found that to make the plan work well the farms should be near each other and the roads must be good to save valuable time getting milking equipment from one herd to the other. Last year ten more groups of Dutch farmers started cooperative milking, and now the group of Iowa farmers is giving serious thought to the plan.

Frank Meissner

This Plan ...makes hog raising SO EASY ...helps you get the MOST from your hog farm investment

The Semi-Solid System is an entirely new idea in raising hogs. All feeding is done over the fence. You save steps because hogs are in a compact area. Sows are handled conveniently in groups of six or seven. Market hogs are fed in *dry-lot,* fifty to a pen. One man can raise 1,000 hogs a year on this system.

MAKES DRY-LOT FEEDING PRACTICAL

A good, balanced feeding program is the heart of the Semi-Solid System. Market hogs are self-fed corn and supplement—given Semi-Solid PIG Emulsion as a drink. Sows, boars and suckling pigs receive Semi-Solid SOW Emulsion in their ration.

This sound feeding program makes possible the results of the Semi-Solid System. It helps save feed. Makes dry-lot feeding of hogs practical. Other benefits such as large litters weaned . . . fast gains from weaning to market, all these result from this planned and proved Semi-Solid System . . . the *easy* way to raise hogs.

See your feed dealer *now* for Semi-Solid SOW Emulsion and Semi-Solid PIG Emulsion in 100-lb. drums or 500-lb. barrels.

CONSOLIDATED PRODUCTS CO., Dept. FQ3, DANVILLE, ILLINOIS

Gentlemen: Please send me complete plans, blueprints and ideas on your Semi-Solid System of Raising Hogs.

Name ..... Address .....

Size of Farm .....acres. Landowner ..... Tenant .....

Location of Farm .....Name of my feed dealer .....

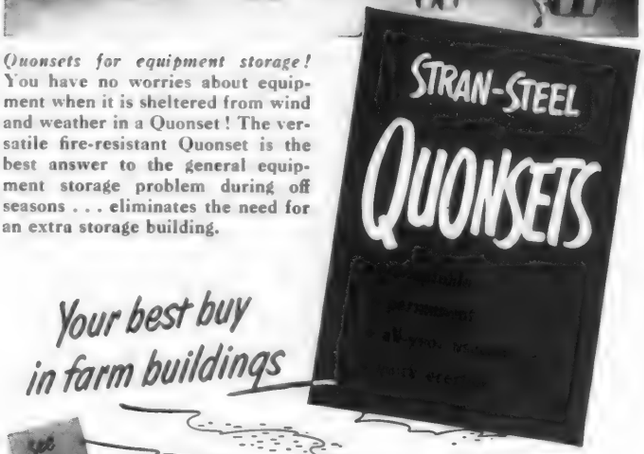
"The Semi-Solid System" OF RAISING HOGS

DOUBLE USE OF QUONSETS ADDS TO FARM INCOME

Versatile, all-steel buildings safeguard crops—serve as farm shelters the year around

Quonsets for crop storage! Here is one way to add to farm income. Use Quonsets! Hold your crops for highest prices! Strong, sturdy, durable, all-steel Quonsets provide maximum protection for stored crops at a low cost per bushel . . . provide the utmost in usable space. Quonsets can easily be partitioned to store more than one crop at once.

Quonsets for equipment storage! You have no worries about equipment when it is sheltered from wind and weather in a Quonset! The versatile fire-resistant Quonset is the best answer to the general equipment storage problem during off seasons . . . eliminates the need for an extra storage building.



GREAT LAKES STEEL CORPORATION

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FARM BOOKS

Animal Sanitation and Disease Control, *by R. R. Dykstra. The Interstate Printers—Publishers, Danville, Ill. $3.50*

The stockman's demand for a good book that will tell him how to be his own veterinarian has about as much chance of being filled as has Franklin P. Adams' desire for a "good five cent nickel." The reason for this is that no book can contain within its pages a substitute for the six or seven years of college study and laboratory work that are necessary to become a qualified veterinarian. Dr. R. R. Dykstra, author of *Animal Sanitation and Disease Control*, is, of course, perfectly well aware of this problem since he was for years the Dean of the School of Veterinary Medicine of the Kansas State College.

"The thought farthest from my mind has been to provide a text for the treatment of animal ailments by those lacking formal veterinary training," Dr. Dykstra says. Instead, he has attempted in this 800 page book to outline the steps that the farmer must take to prevent disease from getting a start with his animals. The emphasis of the book, falls on the causes of the various diseases in animals and the methods of eliminating the causes and preventing the disease.

The first three sections of the book, comprising 19 chapters, take up the general discussion of health and disease factors and methods of disease control. The remainder of the book is divided into sections dealing with different types of animal ailments such as: infection, external and internal parasites, communicable diseases, and the like. This grouping flows logically from the general objective of the book since similar preventative measures will be taken against diseases falling into the same general category.

AN OUNCE of disease prevention is recommended to livestock men.

Under each general heading, the diseases that fall within the group are described. Bang's diseases, for example, is discussed in the section on infectious and communicable ailments, and acute bloat is taken up under non-infectious, sporadic ailments. Dr. Dykstra takes up each ailment separately and describes the symptoms of the ailment and lists any other conditions that might aid in diagnosis. Diagnosis is further aided by the inclusion of many unlovely, stomach-turning photographs of such things as cancer of the eye, lesions in the gullet, and bleeding warts. He then discusses the practices that should be followed to avoid the disease and the methods that can be used to prevent its spread to other animals on the farm. Rarely does he go into detail as to the method of curing the disease, though he often goes into the general nature of the treatment. He leaves treatment in the hands of the veterinarian where it properly belongs.

Though there is no easy key for identifying any specific disease from its symptoms, the book is carefully indexed with ailments listed under their common as well as their scientific names.

Dairy Science *(second edition), by W. E. Petersen. J. B. Lippincott Company, New York, $5.00*

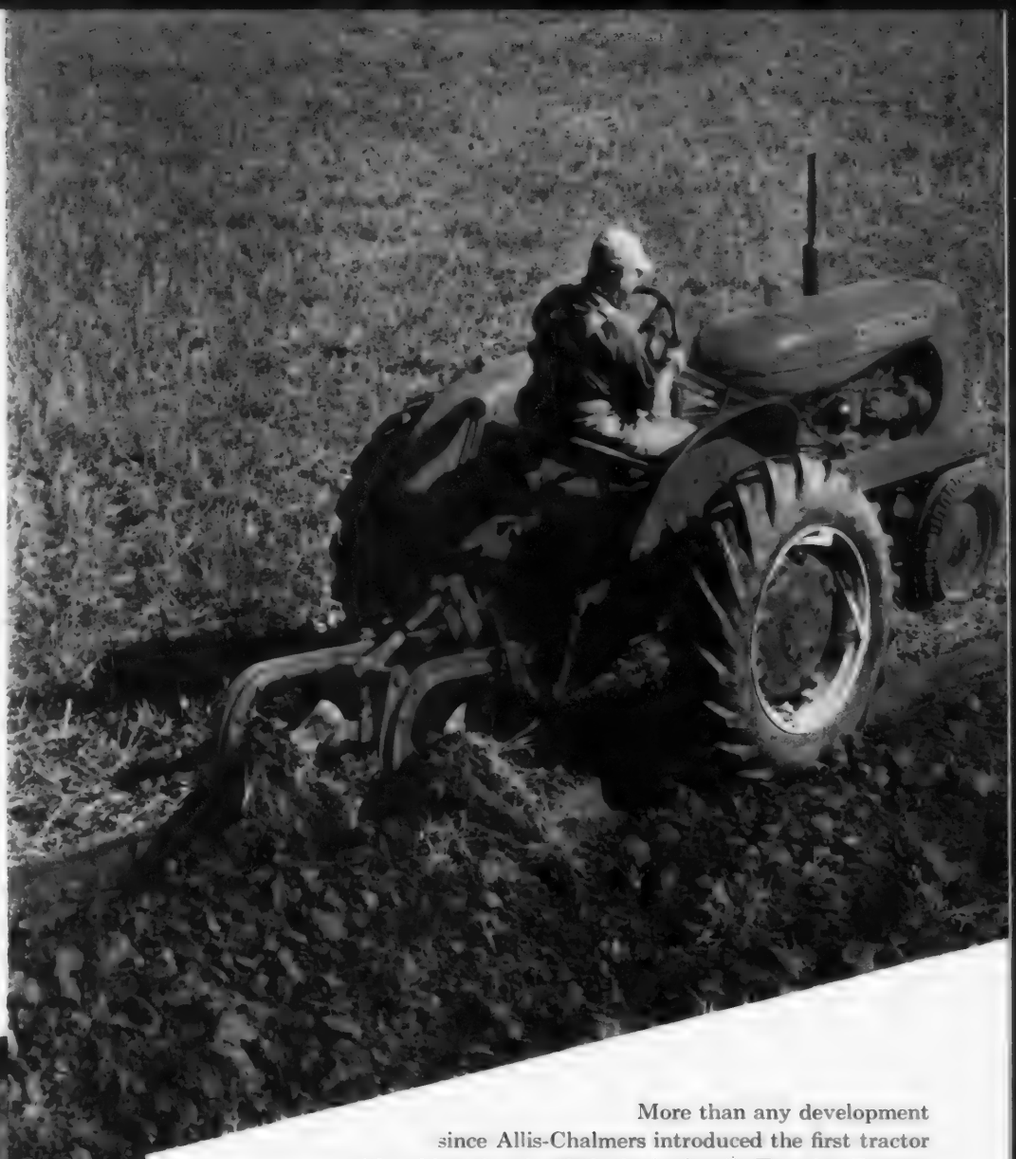
The first factory-type milk plant of any sort in the United States, a cheese factory in Oneida, New York, was started less than a hundred years ago. The first creamery was started in

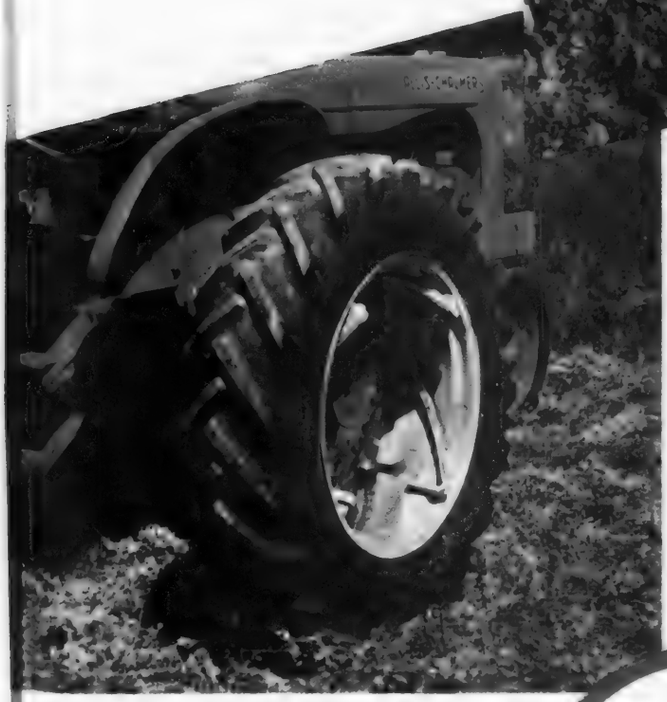
(Continued on page 142)

Allis-Chalmers

WD

demonstrates new earth-gripping traction





More than any development since Allis-Chalmers introduced the first tractor with rubber tires in 1932, the hydraulic Traction Booster increases the usefulness and pulling power of the farm tractor.

Its 4-cylinder hydraulic pump mechanism automatically shifts weight to the rear wheels as the load increases. The WD's quick-mounted plow, with two full 16-inch bottoms at your control, bites deep and stays deep. Mounted bedders and listers are also operated by the WD hydraulic Traction Booster system.

The WD actually gives new meaning to the word "tractor." Not only does it pull... the WD boosts traction when you need it. Adjusts its own rear wheel spacing with engine power. Lifts and lowers implements. Operates power take-off and belt-driven machines . . . and through its new two-clutch system, controls the power take-off driven machines independent of forward travel.

Here is down-to-earth power for your family farm. *It's years ahead. It's priced sensibly. It's Allis-Chalmers!*

ELAX! let WD engine power do it

WER-ADJUSTED WHEEL SPACING—uses power the engine to change rear wheel width.

Seventeen new features include new hydraulic Trac- Booster, Touch Hydraulic System, Two Clutch wer Control, hydraulic comfort seat, light-pressure t brakes, low pitch muffler.

WIDE-ADJUSTABLE front axle, or single front eel available.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

for better living . . . better farming . . . more profit

ONE OF HENRY BENNETT'S hired men sorts cow beets, buried last season. Farm laborers are organized, average $14 a week, base pay, but rents and food are very low.

What is it like to farm in

BY R. J. McGINNIS

The British farmer gets a bonus instead of a quota, but Socialist controls keep his income down.

HENRY BENNETT farms 70 good English acres in the county of Kent. Henry does not own the land, but subleases from his father, who has leased it for forty years. Being a tenant does in no way affect Henry's pride in being an English farmer, for the absentee landlord is common enough in England and most of Henry's neighbors are renters.

He looks upon the farm as his own, which for all practical purposes it is. It is no more difficult in England for the camel to crawl through the eye of a needle than it is for a landlord to dispossess his tenant. Twelve years ago, when Henry's father felt he could take it easy, he sub-leased the farm to his son. Only a third of the farms in England, Wales, and Scotland are farmed by the owners, and most of the owner operated farms are

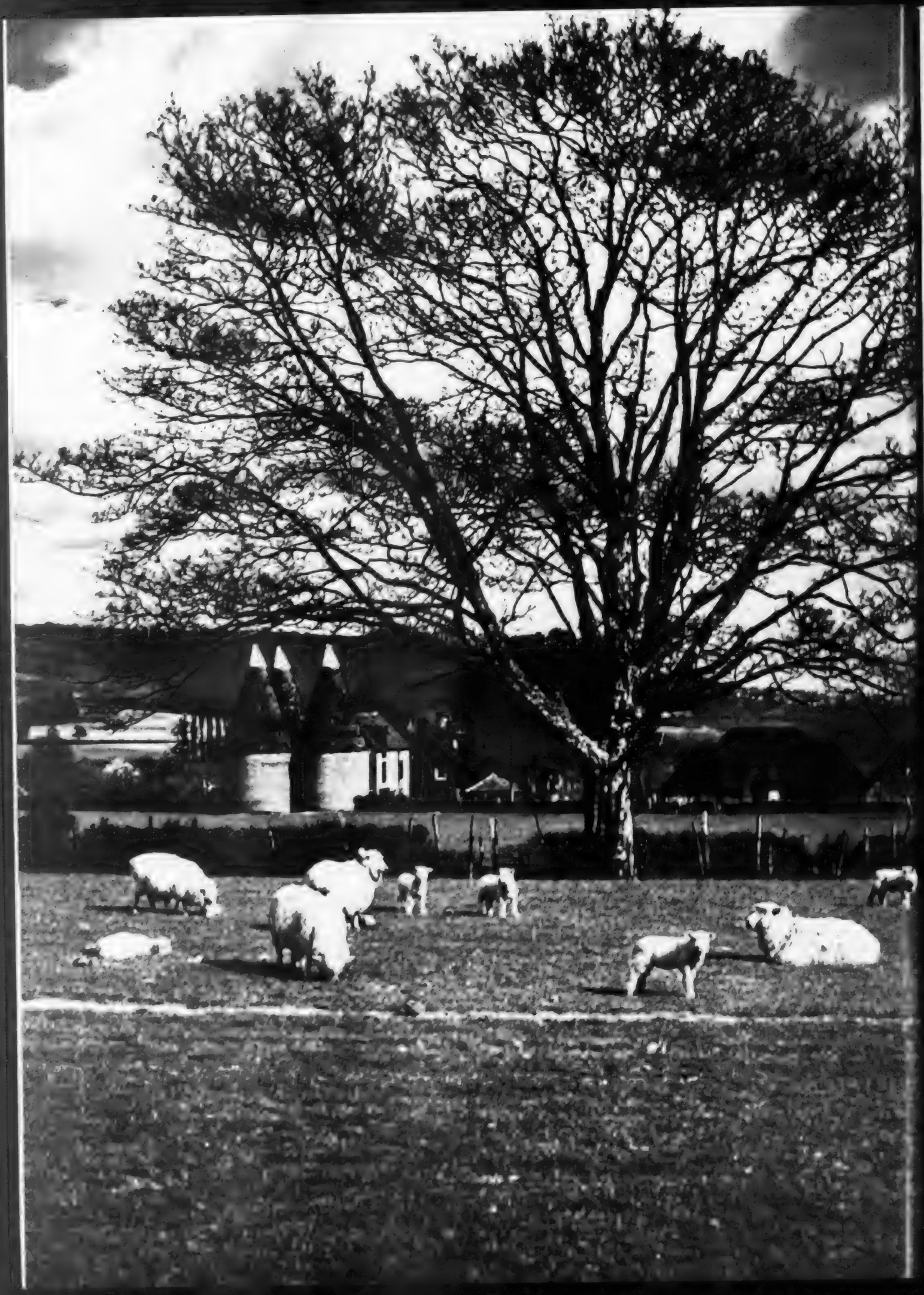
FIFTEEN LABORERS worked this 135 acre farm. The Committee took over, released 13, installed its own tenant. The manor house and the new tenant, B. H. Bush.

SOCIALIST ENGLAND?

the larger holdings. There is no large class of small holders in England, such as one finds in Holland, France and the other west Europe countries. Of the United Kingdom's 530,000 farms, 138,000 are from 15 to 50 acres and the average size is 75 acres. In all of the United Kingdom there are only 15,000 farms of 300 acres and over.

Henry is conscious of the landlord only when he has to dig down for the quarterly or semi-annual rent check. His 70 acres is a small farm by American standards, but even in austere England, he does right well in making a living and laying by a bit for his retirement. He has 8 acres of wheat, 22 of oats, 5 acres of potatoes, one of cow beets, 4 acres of cabbage, 10 acres of meadow, 12 acres of permanent pasture, and the remainder in vegetables, berries, and yards. His money crops are his fruit, cabbage and potatoes. The other crops are insurance and necessary in the rotation. He farms intensively and gets good yields. His wheat last year made 48 bushels per acre. His potatoes were better than usual and he took off 50 British tons from his 5 acres.

To consume the grain and forage which his rotation demands and to supply the volume of manure which he likes, he has a sheep-cattle operation that pays well. He maintains 25 hoggs (Kentish for ewes), which in 1950 dropped 32 spring lambs. He will sell these this fall at 40 pounds for about $16.00. He keeps enough ewe lambs for replacements. His ewes are Kents and he crosses them with a Suffolk ram. He takes three lambs from each ewe and then sends her to the mutton market.



◀ KENT is the hop growing center of the United Kingdom. The tower-like kilns, with their white wind vanes, cluster around the stables on almost every farm.

Each fall he buys from 18 to 20 grade heifers of mixed breeds, four or five months old. He roughs them through the winter on hay and straw and a few beets. In the spring, he sells off the poorer ones and fattens the remainder on his pasture. Most of them are Shorthorn—Ayrshire-Frisian crosses. Although he figures to make a little profit on the heifers, he keeps them primarily for the manure they produce.

Free Market Produce

Since the price of green vegetables is not controlled, Henry sells his cabbage on a free market. He has an ancient lorry and when his cabbage and fruit are coming off he hauls them to London, 40 miles away, and sells them to commission merchants or in the market. If he has surplus cabbage he feeds it to his sheep and cattle. For pin money his wife may dress a half dozen culled hens on market days, or send a hamper of vegetables from her kitchen garden to the London market.

She has 200 laying hens and is trying to build her flock up to 1,000, which was its prewar strength. They are fed the oats from the farm and a little laying mash, which is rationed and expensive.

The problem of stock feed brings the U. S., and the Marshall Plan very close to Henry's door. Since much protein comes from the dollar countries, America's aid to Europe means to him a continuing supply of feed and fertilizer. A 14% laying mash costs him about $4.00 per hundred weight, a reasonable price, but dependent on dollar credit in America. Eggs are sold at the fixed government price. In 1950 the average was 65 cents.

He keeps two cows for his own use; one is a fair grade Jersey and the other, which he calls a "Brindle," is mostly Shorthorn.

Mrs. Bennett manages the cow and chicken money. "I often say to Enery, 'Enery, if it hadn't been for the cows and our chickens during the war we would've had a bit of hard going. Many months we didn't have anything but the butter and egg money.' "

Henry has no horses. He sold his last remaining nag when he was able to buy a second tractor. He has a manure spreader and adequate gardening and farming tools for his crops. Some of his tools are the worse for wear from long service, but he can plan on replacements from British factories. His oats and wheat are custom combined.

In addition to himself, his wife, and his father (who does odd jobs) Henry employs two men regularly throughout the year. During the busy season, when he is taking off his fruit, potatoes and cabbage, he will hire three or four extras. These he has been able to get through the government employment agencies, which maintain transportation services from the cities for seasonal workers.

For all crops Henry probably uses twice as much fertilizer as is used in America. He puts 300 pounds of superphosphate on his wheat when he plants it and top-dresses it with 300 pounds of 16 per cent nitrogen in the spring. Manure all goes on the potatoes and beets, which are also fertilized heavily. He will top dress his grass with 300 to 600 pounds of a high nitrogen formula during the grazing season. He watches closely the humus content of his soil and its pH. Through his county agricultural adviser he gets advice, soil analyses, and services similar to those available to the American farmer. His rotation, designed to supply a high humus content, is somewhat flexible, but would be some variation of grass - grass - grass - potatoes - beets - cabbage - wheat.

Fruit Brings the Cash

Henry balances his budget with his fruit. Since this small farm supports four families, his fathers, his two laborers' and his own, he must work on a narrow margin. When the fruit crop is good he makes some money, but in a bad year he's lucky to break even. He must pay 90 pounds ($252.00 American) rent per year. This is low rent for 70 acres, but the farm is in a frost pocket, and the fruit is a gamble. He pays $14.00 per week plus overtime to each of his regular men and the same amount to seasonal laborers. Laborers may earn up to $5.00 or $6.00 overtime. They work 47 hours a week. All farm laborers are organized in England and have a rather handsome arrangement for holidays, sick leave and vacations. While rents and wages have been compiled on U. S. values on the basis of a devalued pound ($2.80), the buying power of the pound, in the purchase of food, lodgings and services is much greater than its

A SEMI-AUTOMATIC POTATO PLANTER drawn by a diesel tractor. Potatoes are a basic hog fattening feed in Scotland. The Scotch, who prefer a small, yellow variety for table use, say the large, white spud favored by the American housewife is fit only for hogs.

THE INTERIOR OF A CTESIPHON. A series of loafing stalls are built in the center with a driveway down each side and around the ends. Feed troughs are shown. Under the low slant are calf stalls and feed storage. Window space is optional.

equivalent in dollars. As an example, rents for good cottages for workers range from $1.00 to $3.00 per week.

In 1949 Henry's farm grossed $5,600. He made a little money because his fruit crop was good. In late spring of 1950 Henry looked forward to a profitless year. In late April, when his pears and plums were coming into bloom, three inches of snow fell and a half inch of ice formed in the watering trough. "We piled straw among the trees in the evening," he said, "and about midnight we started burning it. We did that every night while the frost lasted, but it nipped us anyway." His fruit profits will be lean.

Henry's Home Life

Henry's farm lies in that part of England favored by the tourists and week-end vacationists from London. Of such a spot the poet's phrase, "This is my England," was written. Skirting his farm is the highway from London to Canterbury, immortalized by Chaucer in his *Canterbury Tales*. The farm buildings on the Bennett farm reflect a permanency and timelessness rare on American farms. The barn is of brick. Two large hop kilns, jutting out from one end like medieval fortress towers, give it an air of age and distinction. This is the English hop country, but Henry discontinued the crop during the war when labor was scarce. The kilns are now used as granaries and hay storage. Fences are either of stone or hedge, and there's not a weed on the farm. A weed, even along the highways, which in America provide a perpetual reseeding program for bordering farms, is a rarity in Great Britain. The neatness and the aspect of changeless order greatly impress the American visitor.

For centuries the sheep have trod the same path from the fold to the stone trough by the spring in the orchard; each twig on each tree has been watched and trained, its fruit zealously measured and guarded; the mangers of oak are worn to an enduring patina by the soft flanks of generations of cattle. An English farm impresses one as a place long lived in and loved.

Henry lives in a neat brick house of great age. It has three small bedrooms, a tiny parlor and a kitchen-dining room. A small coal burning cook stove sets in a niche in the kitchen wall. Henry has an understandable yearning for creature comfort and has first call on a large overstuffed chair crowded into the niche. On rainy winter days when work is slack, Henry puts his feet in the oven and snoozes. This upsets Mrs. Bennett's routine, for the kitchen is scarcely large enough for such luxury. There is no refrigerator, no radio and no electric lights. Bathing is a tub of hot water in front of the kitchen stove on Saturday nights. Henry is very impatient with his neigh-

THIS IS A CTESIPHON DAIRY BARN, a unique and durable low-cost building erected on the Mackie farm. It is 200 ft. long and 40 ft. wide and has no internal obstruction. A heavy cloth is stretched over steel girders, a half inch of concrete is poured over the cloth, heavy wire is placed over this, and 4½ in. of concrete finishes the job. The girders are removed after the concrete sets. This building cost $4,500 and is permanent. Upkeep is nil; it is fireproof.

bors who will not put up the necessary $150.00 to bring the English version of rural electrification to the community. War time economy curtailed the expansion of rural electrification, but the program is under way again.

The Bennett's have one luxury, cold running water in the house. The outside privy is where it would be on an American farm, at the end of a path through the garden. On Sunday Henry and his wife go to church in a ten horsepower, prewar English car. There's a Saturday night picture show in a nearby village, but Henry is not a fan and hasn't attended for many years. His wife tends the garden, the poultry and the cows. Their two sons are married and work on nearby farms.

Although he gets up at five o'clock in the morning during the busy season, when he is hauling cabbage or apples to the London markets, by American standards he is not a hard worker. He has spurts of activity, but on the whole he follows the English tradition that the boss doesn't work. He habitually wears a tie and does what his hired hands can't do. This 70-acre farm, even with its fruit, potatoes and cabbage, would be worked in America with less man power, but the total amount paid in wages would be about the same. In America the farmer would contribute a full day's labor the year around, and do the managing as well. In England management is regarded as a full time job.

Austerity has not brought want to Henry's household but it has brought drabness. He is a civilized man, but has little opportunity to practice the amenities.

Tea Time

That invisible thief of British time and substance, afternoon tea, is the high spot of Henry's day. He looks forward to this pleasant pause in the afternoon work when he can leave the job at hand, stretch himself in his favorite chair before the kitchen fire, and sip long drafts of his favorite brew. He partakes of whatever victuals his wife has been able to collect, for three o'clock tea is "tea" in name only. Depending on the affluence of the home, tea may range from a slice of bread and butter (and, of course, three or four mugs of tea) to rare viands, sandwiches of all kinds, cakes, great hunks of marmalade, and pastry.

All work grinds to a halt when tea time comes in the United Kingdom. There may be no shilling for the gas meter, no bacon in the larder and the children may need shoes. These things the Britisher passes off with his philosophical calm, much as he did the buzz bomb. But if there is no box of biscuits on the shelf, or if the tea pot is bare, tragedy has indeed struck.

The foreigner is convinced that there will always be an England as long as the Britisher can support the institution of afternoon tea. They fought for their traditional customs at Dunkirk and during the Blitz. Some foreigners have expressed the facetious belief that if the British would eliminate tea and work during the tea time period they could balance their budget. This is pure fantasy. American farmers usually have a slack time during the winter months; English farmers work 12 months in the mild climate and probably turn out as much total work per year as the Americans.

Henry and His Majesty's Government

Government regulations in England are designed to control shortages; the American government is chiefly concerned with controlling surpluses. Henry's position under the government might be said to be slightly less annoying than that of the American farmer under the American government. The British government encourages because of under supply; the U. S. government restrains because of low prices. Henry produces what the English people want most, food. Therefore, in one way or another, he benefits from the high prices that follow shortages. His chief complaint is that he no sooner gets these high prices than the hand of the government reaches into his pocket, via the income tax, and takes them away again.

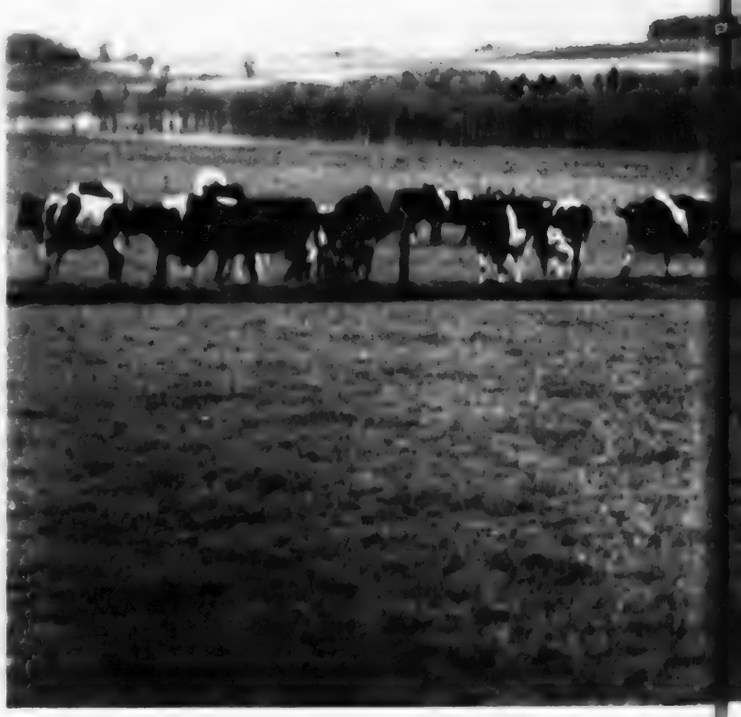
"Nevertheless," he says, "I have the pleasure of seeing the money."

There are no quotas on what Henry produces, but he must sell the bulk of his produce at prices fixed by the government. Sometimes he believes that if prices were allowed to be freely dictated by supply and demand he might benefit more. However, by and large, in comparison with prices elsewhere in the world, he is doing very well.

Until recently he has been the beneficiary of subsidies and bonuses of many kinds: bonuses on a per acre basis for getting marginal land into cultivation; bonuses for extra acres of potatoes, wheat, etc., as well as for each acre of certain vital food crops; bonuses for each calf produced, and many others. These have about all been discontinued, that on potatoes ($28.00 per acre) in 1949. The calf subsidy is still in force. These subsidies have stimulated him to greater effort. He is confused by the type of subsidies being paid to American farmers, and the reason why they are being paid. "It look queer to me," he said. He can't imagine a surplus and the problems created by surpluses. In all the long history of England agriculture there has never been a home-grown surplus.

To compensate for the discontinuance of subsidies there has been a slight corresponding boost in the fixed prices set by the government. A comparison of the wheat prices in England and America indicates that this is "one world," for they were about the same, but Henry will be able to buy more staple necessities with his wheat money, dollar for dollar, than his American cousin.

Henry cannot buy all he wants of certain vital farm necessities. For instance, he cannot buy all the laying mash or dairy mixture he would like to have. The quotas have been less than what he likes to feed for maximum production. The regulations governing the amount he can buy have never failed to contribute to Henry's amazement and confusion. As an example, here in a much simplified form are the regulations governing the supply of chicken feed. If you have under 12 chickens, you get no feed ration for them. Their protein is supposed to come from table scraps and their grain, of course, from the farm. However, you may do as you please with the eggs you get. You may give them away, throw them at the crows, eat them yourself, or sell them for as much as you can get for them. You retain your egg ration card. If you have from 12 to 25 chickens, you can get 50 percent of your feed ration needs for them. But you must give up your egg ration card, that is, you can't buy eggs if your hens happen to stop laying. You can sell your eggs wherever you want to. Now if you have more than 25 laying hens, (1) you get a feed ration based on the size of your flock before the war, (2) you give up your egg ration, (3) you must sell your eggs to a packing station at a controlled price. You may eat all you want and give away all you want.



TRENCH SILOS with concrete floors are dug conveniently near the stables. First cuttings go in without preservatives. Spoilage is reduced to minimum by concrete slab covers.

The recent fixed price of eggs in England has ranged from 48c to 70c, depending on the season. The average price last year was 65c. Henry does all right with his hens.

Dairy cow rations are based on the size of the herd and on the quantity and quality of milk production. Last spring both eggs and milk went off rationing. Fresh meat, bacon, butter and margarine, sugar, candy, tea and most tinned foods, especially tinned meats, were all rationed at that time. Items may go on and go off as supplies fluctuate. Eggs and milk are likely to go back on the list this winter.

The whole plan of British agriculture is

CENTURIES AGO the Scotch bent the thin, heather-covered hills, the granite slopes, and the dour weather to their will. Grass farming is the established management. Here two cows per acre graze from April to October on cocksfoot, timothy, and clover.

at present pointed toward that unhappy day when American aid to Europe will cease. Against that day the government has launched a plan for increasing farm production. Briefly this is designed to increase food production 50 per cent over prewar levels. Great progress is being made in this plan by (1) increasing the quantity and quality of grass by heavy fertilization and good management, (2) eliminating scarce dollar feeds in winter by producing more silage, (3) improving marginal lands, (4) increased efficiency from mechanization and improvement of live stock. By the summer of 1950, Britain was producing 40 per cent above prewar and the goal seemed not far away. The national average of milk production before the war was 500 gallons per cow per year. This has now been boosted to 650 gallons and could be boosted still higher if high protein feeds were plentiful. Since most of the high protein feed is being supplied by Marshall Plan dollars, British bossies may fall off should foreign aid cease. British planners believe it is possible to supply enough high protein grass and silage to keep up production.

Poor Husbandry Controls

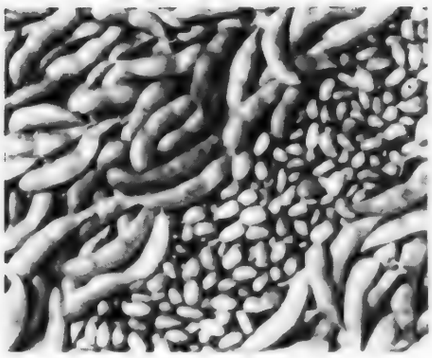
There has been a great deal of misinformation in circulation on the so-called Poor Husbandry Controls in Britain. These controls were inherited from war time legislation, continued and somewhat altered from time to time by the Labor party. In reality the bark of Poor Husbandry Controls is much worse than it's bite. Briefly, the Agricultural Act of 1947 creates sanctions that may be used to remove the chronically indifferent farmer or land owner who is not fulfilling his responsibilities to the land. The law is administered by county committees composed of farmers, landlords, labor representatives and members of the government. In almost all cases, agreements have been reached and the farmer has been induced to do right by his land without the necessity of invoking the full provisions of the law.

War time necessity coupled with Britain's woeful lack of arable land in proportion to its great population has brought into fashion the notion that a man cannot own land in the sense that an American farmer owns land. Land, according to this school of thought, belongs to the whole people and should be used intelligently and efficiently to produce its maximum for the public good. The farmer cannot abuse it as he wishes. He is rather the trustee, but he may pass his trusteeship on to his heirs, which is about the measure of ownership that the British landlord now has. If he is found guilty of poor husbandry, as a landlord he may be forced to sell the land to the government, which rents it to a qualified tenant; if he is a tenant, he may be put off the land and told to go to work elsewhere. There have been few cases of forced sales and very few cases in which the tenant was dispossessed. County agricultural authorities have kept a watchful eye on farmers in their counties and have been quick to shake the law at offenders. The British are by tradition good husbandmen and warnings have usually proved sufficient.

Henry Bennett cites a flagrant case of mismanagement in his neighborhood and his blood pressure rises when he discusses it. An industrialist from London, who

(Continued on page 90)

There is no soybean surplus. Once a nobody among farm crops, this immigrant legume has taken on a long list of odd jobs both on and off the farm.



BY DAVID HELLER

The rise of the SOYBEAN

IN Peoria, Illinois, five men recently sat down to a very unusual meal. First they were served with soybean soup, big steaming bowls of it. The entree was soybean cutletburgers, substituting for meat; the bread and muffins were made from soybean flour; the side dish was creamed fresh-frozen soybeans. There was soybean mayonnaise on the table beside the dish of soybean margarine, and there was also a plate of soybean cheese. Then for good measure, the soybean eaters were given samples of Chili con carne and chop suey which were, of course, made from soybeans. To fill in the chance vacancies in their stomachs, they sipped at their soybean malted milk shakes; and dessert was a wedge of tasty lemon pie complete with meringue made from the protein of soybean flakes. After dinner, as they sat around the table nibbling from a nut dish filled with roasted soybeans, they topped the meal off with a stein of soybean beer.

This menu, as all those who partook of the meal agreed, is a lot of soybeans at one sitting. We will probably never be forced to rely on the soybean to such an extent for food, but the fact that it can be done is only one more reason why the farmer will likely find a ready market for all the beans he can grow for some years to come.

The regular soybean that we all know is already serving a wide variety of uses in industry and as a stock feed, and scientists are working constantly to give it more and bigger jobs. Now the rise of new varieties for human consumption adds another reason for increased acreage and a continuing good market.

The rise of the soybean is a true success story, for within the memory of many of us this crop was considered a novelty, an interesting legume that would probably never amount to much as a cash crop. Then, in a relatively short time, new work was found for this Oriental immigrant and it started a rapid climb to fame.

The happy thing about the success of the soybean is that it has brought additional income to thousands of farmers. It is now the basis of a multi-million dollar industry; in 1949 alone, farmers banked $441,000,000 from the soybeans they sold off the farm. It ranks now close to the old dependables, corn, wheat, and cotton, as a money maker.

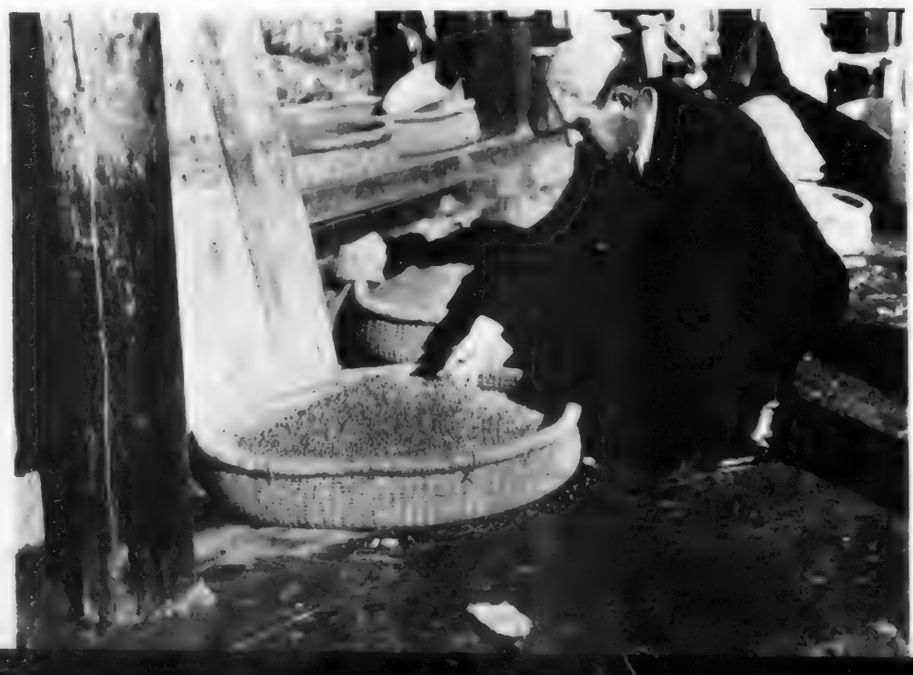
And if the recent years have been good for the soybean and the farmers who produce them, the future looks still better. As far into the future as the agricultural economists and the cross-road prognosticators can see there appears nothing but boom times for this versatile legume.

What is the secret of the soybean's success? Primarily, it is its ability to do a wide variety of jobs and do them well.

Soybean oil, for example, leads the field of vegetable oils. It is used for making shortenings, salad oils, margarines, paints, soap, synthetic rubber and even candy. And after the oil is removed, the remaining soybean oil meal is mixed with stock feed to supply high quality protein.

The soybeans that leave the farmers' fields may come back to the farm, but they would not look the same as the crop which once went through the combine. They come back in many of the packages of food we purchase at the grocery store in town: most of us eat some soybeans every day, whether we realize it or not. Bakeries are mixing small amounts of soy flour with their wheat flour to make bread. "When research men learn the secret of combining soy flour with other flours to give the latter greater nutritive value, and produce at the same time a loaf with the texture, flavor, and other qualities consumers desire, bakeries will probably use more of it."

What do all these new developments in the life of the soybean mean to the farmer who produces the crop? Primarily, the wide variety of uses for soybeans means



THE FATHER OF THE SOYBEAN, William J. Morse, inspects a basket of soybeans in an isolated Korean village. He shipped home 5,000 new varieties including the ancestors of our present strains.

TWO VARIETIES OF SOYBEANS were grown side by side on this Michigan farm. The bushy plant in his left hand is the new Hawkeye, the thin one is Erliana. Plant breeders have worked with soybeans for half a century to develop beans for every use including food for man, his livestock and for plastics, paints and varnishes.

that farmers have many markets for their bean crop. If the paint industry can't absorb all the current crop, the surplus can go to adhesives, or margarine makers. All of these markets demanding soybeans as their raw materials help account for the fact that we have no surplus of the hard-working bean. Soybean mills have never been able to operate at a full capacity; they've never been able to get all the beans they need.

The Constant Success

The soybean has thrived on adversity. When other crops have failed to make a profit, soybeans saved the mortgaged land. In the mid-1930's severe drought ruined huge acreages of corn, wheat, small grain and hay. Soybeans were planted as a late emergency crop and supplied livestock feed to fill the gap.

Depressions and wars have only served to increase soybean production. After the 1929 crash, farm prices, already crippled

ORIENTAL FARMERS supplied Dr. Morse with seed of their individual varieties. After centuries of isolation, each community had its own variety.

SOYBEANS do best on fertile soil where they are planted in rows and cultivated like corn. Sloping fields should be contoured and short slopes drilled solid.

EXPERIMENTAL PAINTS ARE TESTED on these outdoor panels at Northern Regional Research Lab. Soybean oil is less expensive than linseed oil and now makes good paint.

by huge surpluses, sank out of sight. Some crops couldn't be sold for any price. Sheriff's sales and foreclosures became the order of the day.

The soybean made many friends in those troubled days. Formerly prosperous farmers found themselves without a market for the crops they were growing. Desperation forced them to try soybeans and soybean production doubled in two years. Prices were rock bottom, but there was always a ready cash market for soybeans at prices far better than most other crops would bring. Many a farm was saved from the auctioneer's hammer by soybean cash.

In 1917 our soybean production was a mere 3,000,000 bushels. Spurred on by war time prices, farmers planted all the beans they could, but large imports of soybean oil from Manchuria were still necessary. Washington officials learned that the soybean can play a big part in winning a war. The lesson was applied again in World War II. There were dire predictions among the pessimists that the soybean would face a postwar "bust." But the market is still good, and the demand is growing.

Mr. Soybean

Behind the rise of the soybean is the story of a man who has spent most of his adult life working with the crop. It was in 1907 that William J. Morse went to work for the U. S. Department of Agriculture. Bill Morse's diploma from Cornell University was only two days old. His first assignment attracted little interest, for he was told to investigate the possibilities of commercially growing soybeans in America. At that time the soybean was still a little known curiosity in this country.

But that assignment meant the beginning of the soybean's success in America, for Morse took his assignment seriously, and today, even though he is retired, he still works with soybeans.

Dr. Morse didn't have much to start with. There were only a handful of varieties and they were all of low oil content and not widely adapted to varying soils and climates. That hardly mattered at the time, however, for there was almost no market for the soybean. Not a single soybean processing plant had yet been built in America.

Morse gave the situation some serious thought and decided that first of all he would have to improve the known varieties where he could. He was spending every working day at his plant breeding, but soon found himself spending weekends and evenings as well. He was breeding and cross-breeding soybean plants as fast as nature would allow, for he could already see a possible bright future for his protege.

In 1914 he made a big step forward by importing from Manchuria two new varieties, the Manchu and Mandarian. Both of these had high oil content. His breeding experiments on these two plants laid the groundwork for lifting the soybean to

its present throne as a high value agricultural crop. Practically every high oil content soybean grown in this country today can be traced back to the Manchu or Mandarian.

Morse has had a hand in the development of almost every soybean variety in the United States, and this helps account for his unofficial title, Father of the Soybean.

In 1929 he was given what turned out to be his biggest job in the search for a better bean; he was sent to the Orient, the home of the soybean. His orders from the Department of Agriculture were rather general: he was told to bring back new varieties of soybeans which might contribute to the still youthful American soybean industry.

For two years Morse tramped the backwoods of Japan, China, Korea, and Manchuria, carrying out what seemed like an endless task. Lack of transportation had limited the spread of soybean varieties, and as Morse said, "Almost every village in the Orient has its own distinctive type of soybean. Thousands of years of close cultivation and inbreeding in every neighborhood has made each village's type a little different from any other in the world."

He checked the village markets to see if there was any trade in seed between localities. There wasn't, and consequently, he was forced to conduct a village-by-village check of the beans growing in the fields. He inspected every new soybean variety he found and when one looked promising he obtained a sample. When he returned to the United States in 1931 he had a collection of 5,000 new types of beans, including 150 of the edible green varieties, with which to continue his selection and breeding work.

On his way home he stopped in Tokyo and showed Japanese agricultural experts thousands of varieties of soybeans they never knew existed.

Soybeans are still one of Dr. Morse's first loves. And chief among them in his affections are the edible types of soybeans. In his opinion those scoffers who belittle the eating qualities of the soybean have been denied the good fortune of sinking a bicuspid into them.

We'll Eat More Soybeans

In his years of soybean work Dr. Morse has made many predictions about the future of his favorite plant. He has seldom been wrong in these guesses, and today his favorite prediction is that farmers are going to make money raising the vegetable types of soybeans. He thinks the soybean can become a tasty substitute for high priced meats, and that the canners and the processors who sell fresh frozen beans will make an effort to educate the public to the soybean's food value.

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THE COMBINE is a friend of the soil. The mulch it leaves can add as much as 16 pounds of nitrogen to the acre, and protect the soil against erosion.

BY MILLER STEWART

Mouse-town

Meadow mice on an average Midwest farm eat five tons of hay annually. The well-fed mice raise amazing numbers of hungry young to plague the farmer.

THE scientist who discovers how to teach mice birth control will deserve a Nobel prize. As fast as man produces the necessities of life, mice attempt to rob him of them. Man has been kind to mice; his farms have become the land of mouse opportunity, providing the little rodent with endless food supplies and living quarters. Before the white man settled this continent the mice were kept under control by a long list of natural enemies. Man declared most of these predators to be vermin and set about killing them off. Thus he gave the mice a new lease on life and they took full advantage of it.

If you go out into any rich meadow and rake the grass from a spot you will see a network of well defined runways or streets. If you look carefully among these semi-subways about the grass roots, you will see an intricate labyrinth with bays at frequent intervals. Some of these bays are full of dried grass cut in short lengths and formed into flat, soft hanks. These are mouse homes. Some of the bays are covered with small black pellets. These are mouse comfort stations. You have exposed the top floor of Mousetown, the home of the commonest mammal in America, Europe and Asia, the field mouse (*micro pennsylvanicus* or one of his 50 close relatives).

Closer examination will show that there is another level of subways and dugouts below the surface which are also used as homes, storehouses and roadways.

Paradoxically, the country mouse lives in the most widespread city there is. You will find his city from coast to coast wherever there is the necessary cover. Where the cover is lacking, the mouse city simply flows around the obstacle. Mousetown provides home, food, easy transit, and, most important, shelter from the eager eyes of innumerable enemies. In the Northern Hemisphere there are mice of one kind or another, from desert to swamp, from sea level to mountain top.

THIS MOUSETOWN native has a small stomach but a big appetite. He eats often, stuffing himself with grain, apples, seed of cultivated crops, or the bark of young trees.

The mouse has the highest birth rate of all mammals. A female mouse may spend less than 10 per cent of her life unpregnant, and that includes her childhood and dotage. She may be pregnant by the time she is four weeks old, and have her first litter three weeks later while still in her juvenile coat. Scarcely have her babies been snuggled into her nest before the hussy leaves them to get herself in trouble again with the first male she meets. She often accomplishes this feat in less than two hours. If she evades her innumerable enemies for her entire lifetime she may live a full year. By that time she may have had 17 litters of from six to ten babies in each batch. Should all of *them* survive and multiply in mouse fashion, she will end the year and her short life with over a billion living descendants!

The meadow mouse is a short, chunky animal with a short hair-covered tail, bright little eyes, and tiny ears hidden in its fuzzy coat. Its loose fur is rather long and has a blackish, grayish or yellowish brown color, heavily sprinkled with black. This gives it a grizzled appearance. The adult looks like a tiny bear. Though there are millions of them you will rarely see them save as a scurrying shadow across your path on country walks, or as the booty that your cat brings home for leisurely dispatch.

Winter and summer, night and day, the mice scurry along their runways in pursuit of food or mates; both are easy to

DEATH CAME to this meadow mouse in the jaws of a weasel, his most dreaded natural enemy. Were it not for weasels, owls, shrews and cultivators mice might eat the farmer out of business. Some farmers enlist the aid of poisons and traps.

find. The average population ranges from 120 per acre in rich meadow to a couple of dozen in bog forest. This means many thousands of mice per square mile.

The day-to-day destruction by mice is astounding. Each mouse consumes, wastes or spoils his own weight in food every day, or about 30 pounds of green stuff per year. This is about a ton of food for every 66 mice, or almost two tons per acre. Mice feast on cereal or forage crops, planted seed, ripe crops in shock or barn, hay meadows or pasture, garden produce, flower bulbs and seeds, shrubs, and fruit trees. The average farmer in the United States feeds his meadow mice five tons of hay and 50 bushels of grain each year.

The farmer who, as Thoreau said, "knows nature only as a robber" swears loudest when he finds his fruit trees girdled by rabbits, but he never recognizes the heavy invisible tax he pays to mice in reduced yields of grass and grain. Modern farming methods are an invitation to mice. Our abundant yields provide ample provender and our meadows and pastures offer limitless lands for homesteading mice.

On occasions, local mice plagues break-out and no one knows quite why. In Kern County, California, in 1926, the mouse population suddenly soared to 80,000 mice per acre, almost two per square foot! Before the plague ended, the crops on more than 30,000 acres were a total loss. In 1907, in the Humbolt Valley of Nevada, 75 per cent of the alfalfa crop was devoured by a gigantic mouse raid. There are records of mouse plagues from almost every country in Europe, Asia, and North America. In spite of our improved weapons for fighting them these explosions of mice still occur.

In the Wheat Belt, in both 1927 and 1942, winter came early. Farmers had to leave over half of their wheat crop in swath or shock all winter. When they started threshing in the spring they found as many as 30 mice per shock. The threshing machines ran red with blood; the separators were clogged with mangled mice. The yield was almost 15 bushels to the acre less than the same crops which were threshed in the fall.

Historically, mouse plagues have been recorded as far back as the Old Testament. In the First Book of Kings, as one should remember, God sent a plague of mice to punish the Philistines for carrying off the Ark of the Covenant. Herodotus reported that Sennacherib's host, after being overrun by hordes of mice who ate their bow strings, the hilts and handles of spears and swords in a single night, retreated in confusion. Aristotle said "The rate of propagation of field mice in country places, and the destruction they cause, is beyond telling." In the history of New England, 1815 is known as the year of mice, when people said that mice rained down from the heavens and sprang out of the earth.

(Continued on page 134)

YOUNG BARN OWLS live on mice and rats. The hard-working parents maintain a constant food lift, night after night, to keep the family table filled.

Garbage and Sewage are now being turned into fertilizers on a production line basis.

Compost Goes Commercial

BY ROBERT RODALE

THERE is a newcomer to the fertilizer industry. This new type of fertilizer will be made from materials we have been burning and throwing away as fast as possible. It will mean the large scale turning of waste materials into compost and a long list of people stand to benefit.

We need more organic matter in soils that have been corned for many years without being rebuilt, or soils that have been otherwise over-worked. The run-off removes the humus, and so do the growing crops. Composting is a fast method of replacing the valuable organic matter. The compost contains the bacteria needed to keep the soil healthy, and help make plant nutrients available to growing crops.

The commercial compost idea has grown out of the feeling among agricultural specialists that we can no longer afford to burn and throw away our municipal organic wastes.

During the past century, yields have increased steadily with the development of new crop varieties and new tillage practices. And since plant nutrients are the raw materials from which crops are made the fertilizer industry has expanded steadily.

The men behind the commercial compost movement are making headway with their revolutionary plans and some of their new product is already moving out to a few pioneering farmers across the country.

In addition to providing much needed humus for the soil, the movement promises to bring a new source of revenue to cities which now burn municipal wastes in expensive incinerators, and dump sewage into our streams. Several cities are now getting into the compost business, and more are studying the plan. Miami, Florida, has signed a contract making all of its garbage available to a firm that will convert it into compost. Joseph Frazer, one of the founders of the Kaiser-Frazer Corporation, has started the large scale production of organic fertilizer in the Union Stockyards at Chicago. Allentown and Reading, Pennsylvania, have concluded experiments with garbage composting processes and are considering building plants capable of converting their garbage into fertilizer. West coast cities are drawing up refuse composting plans in an effort to reduce the smog menace, one of the causes of which is smoke from incinerators. The city of Milwaukee, Wisconsin, has been treating its sludge by an aeration process for 24 years and selling it under the trade name Milorganite. To date, Milwaukee has sold more than a million tons to all parts of the United States and Canada.

Many departments of sanitation are planning to abandon their costly incinerators in favor of the income producing, composting plants. The success of pilot plants (such as the recent one at Mt. Wolf Pa., conducted by Frazer Products Inc., of Chicago) has caused widespread whispering in municipal circles about the possibility of garbage as a raw material instead of a waste product.

The organic wastes of our cities amount to more than 10,000,000 tons per year. As organic matter loses half its weight as it decays, this supply of garbage could be

converted into 5,000,000 tons of compost. Obviously, 5,000,000 tons of compost could change the fertilizer supply picture markedly.

The two raw materials which are available in abundance are sewage and garbage. Both make good compost and there is little difference in the end product.

As a potential source of fertilizer the sludge filtered from our sewers is almost as important as garbage. Hundreds of tons of it are now being used as fertilizer all over the country. In its raw form its nutritional quality is low and its disease spreading ability is high. Dr. Selman Waksman, discoverer of the wonder drug streptomycin, points out that composting makes sewage safe for using on crops.

In many cases, this sludge will be mixed with garbage that is to be converted into fertilizer; the raw material will be 20 per cent sludge and 80 per cent garbage.

The city of Dayton, Ohio, has been selling about two thirds of its annual sludge production each year as fertilizer. Much of it goes to specialty farmers, and greenhouse operators, but scattered throughout the farm lands around Dayton are a few farmers such as Henry Rehling who use the sludge on their field crops. "I've been using the stuff for 18 years, and I find it's fine fertilizer for everything except potatoes," Rehling says. "Causes scab on potatoes. When we first started using it we spread it two inches thick on our fields. Now we add 500 pounds to the acre every time we plant a new crop. It keeps the humus content of the soil high and that has helped us to increase production every year."

The sludge humus which Rehling buys from the city of Dayton sells for $11.00 a ton in 80 pound bags which is in line with current fertilizer prices. It has an analysis of about 2-2-2. It is processed in huge digesters to convert it into humus and kill harmful bacteria.

Count Your Change

Although the amount of fertilizer that cities are now manufacturing is almost insignificant, predictions are that this young fertilizer industry will grow rapidly in the next decade. As composting plants spring up near centers of population, compost prices should come down. Today, commercial compost is still expensive; it can be bought for $50.00 a ton. At this price, it is attractive mostly to producers of high value specialty crops. The large scale plants now in the planning stage will be able to sell their fertilizers at a lower rate, probably $25.00 or $30.00 a ton.

Why is garbage finally being put to work? One reason is that experimenters have recently learned to compost garbage rapidly. While it formerly took six months for garbage to decay, it can now be converted into dark, odorless humus in as little as five days.

Another reason is the growing feeling among agriculturalists that all is not as rosy as present crop surpluses would indicate. Dr. William A. Albrecht, of the University of Missouri, has been pointing out to farmers that, even though their yields are high, protein content of their crops has been dropping. This drop in food value is more pronounced in depleted soils.

Our soils have skidded from an average four per cent of organic matter 200 years ago to one and one half per cent today. Organic matter is the chief source of nitrogen to most crops. In addition, it provides good living conditions for important soil bacteria.

Recognizing the need for new sources of organic materials enterprising experimenters awoke to the fact, as long as 30 years ago, that garbage can be turned into plant food. Bagasse, the "garbage" of the Louisiana sugar cane refineries, has long been decomposed and hauled back to the fields.

The problem in reclaiming organic waste is how to convert it from a troublesome, raw mass into a product capable of releasing plant foods efficiently. Most of our city engineers still fail to see these organic wastes as potential fertilizer. They burn their garbage in complicated furnaces which they call "destructors." A representative of the New York City Department of Sanitation recently stated that the destructor method is the most satisfactory because it "destroys all the organic matter in garbage and leaves a harmless product that can be used as a fill."

The destructor process is convenient, as the man from New York pointed out. However, cities have always realized that it is expensive and have been constantly trying to find some more profitable means to dispose of their garbage. Some of it is fed to pigs, but garbage fed pigs have four times as much trichinosis as their grain fed cousins.

Another method of disposing of garbage profitably is by using conversion plants that extract fat from garbage. The residue is used as a fertilizer filler. During the war, when fat sold for 11 cents a pound, these conversion plants were gold mines. Now, with fat selling for two cents, they don't pay their way.

How Garbage is Composted

Conversion of garbage into fertilizer in this country has been made possible by artificially speeding up the decay process. The seven factors which influence the process are bacteria, temperature, moisture, air, pH, the size of the pieces of raw material and its composition. Most of these factors cannot be controlled when the garbage is composted in heaps. Garbage conversion experts have designed digesters, large, silo-like tanks, with which they can control every phase of the composting operation.

What is the Secret?

The real secret of fast composting is the use of bacteria. There are 7000 types of decomposing bacteria, and each type works fastest under a different set of con-

DIGESTED SLUDGE from the Dayton, Ohio, sewage disposal plant can be applied with tractor-drawn spreaders. Henry Rehling and his son are filling the spreader to treat wheat stubble before disking. Rehling has used the sludge for 11 years and no longer recalls how much he has applied to his land. He says it's no good for potatoes.

STOCKYARD MANURE is composted into organic fertilizer in five days in the new plant at the Chicago Stock Yards.

ditions. When the random assortment of bacteria, such as those found in compost heaps, are depended on, time wastes while those best suited to the situation multiply and begin to work.

Before putting a digester to work a culture of a few strains of fast working bacteria is mixed with every handful of ground-up garbage that is put in the digester. They go to work immediately, and within a short time, have changed the foul smelling garbage into clean earth.

The digester preserves the correct living conditions for the bacteria. Rotating arms keep the mass moving and allow air to penetrate it. Moisture, temperature and carbon dioxide are checked constantly. As more garbage is carried to the top of the tank by conveyors, unloaders pull the finished compost out at the bottom. In a matter of five to seven days, the garbage is decomposed, dried and bagged ready for market.

The digester used by the Frazer Illinois Compost Corporation is the most advanced. It is glass lined, electrically operated, and directly connected to a bagging plant. A complete plant is now operating in Chicago, composting the manure of the Union Stockyards. As soon as the "bugs" are ironed out, Frazer plans to expand, building digesters across the country, wherever there is a source of raw organic matter. The present production of 15 tons a day is sold out for weeks in advance. One order was received from Puerto Rico for 20 lbs. of this compost to be sent express.

The city of Miami's conversion plant will work on a slightly different principle. The day's collection of garbage is placed in a large concrete tank, sealed and allowed to remain undisturbed for a month. Although the process is slower, the cost of upkeep is reduced.

Miami is the first city to actually enter into a contract with a garbage composting firm. The style of her contract with the Florida-Carribean Bio-Thermal Operating Company may be used as a guide for other cities dealing with composting firms. Miami has agreed to pay $350,000 a year for 20 years for the service of having her garbage taken away, excluding the cost of collection. This is how much it now costs Miami to burn her garbage. City officials feel this long term contract is justified in the face of rising population and disposal costs.

All profits from the sale of fertilizer manufactured from Miami's garbage will be retained by the contracting firm. A $3,000,000 plant will be built by the company within two years.

Others cities plan to finance their own projects. Still others receive royalties on each ton of compost produced. Small cities can compost their garbage in heaps using only bacteria, manpower and tractor mounted manure loaders. A glance at the overall picture indicates that municipalities will find garbage composting more economical than burning and more satisfactory than dumping. The reclaiming of a waste product and the saving of tax money will have its appeal to the tax payer.

Compost and the Farmer

How the purchaser of garbage compost will make out is going to depend on his distance from the source of supply, the character of his soil, the type of crop he produces, and his knowledge of the soil.

Before assigning a permanent place in his budget to this reclaimed waste, he will want to know exactly how it compares to the fertilizer he is now using. Perhaps green manure crops and stable manure would satisfy his organic fertilizer needs more economically.

Actual use is the best way to tell if composted garbage is worth its price. It is possible to analyze it like an ordinary fertilizer and assign it an NPK rating. Sir Albert Howard, the originator of the waste composting concept, said that 100 pounds of composted garbage contains seven pounds of nitrogen, two and a half pounds

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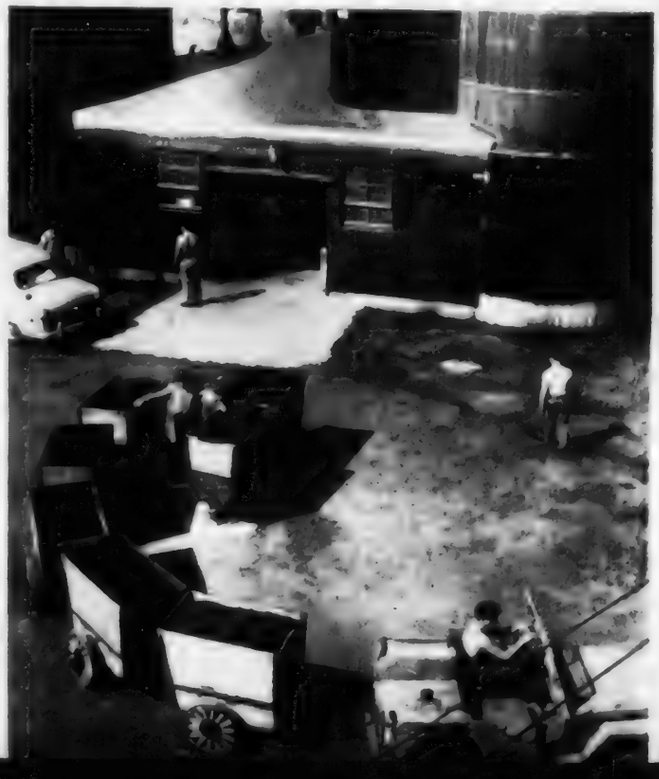
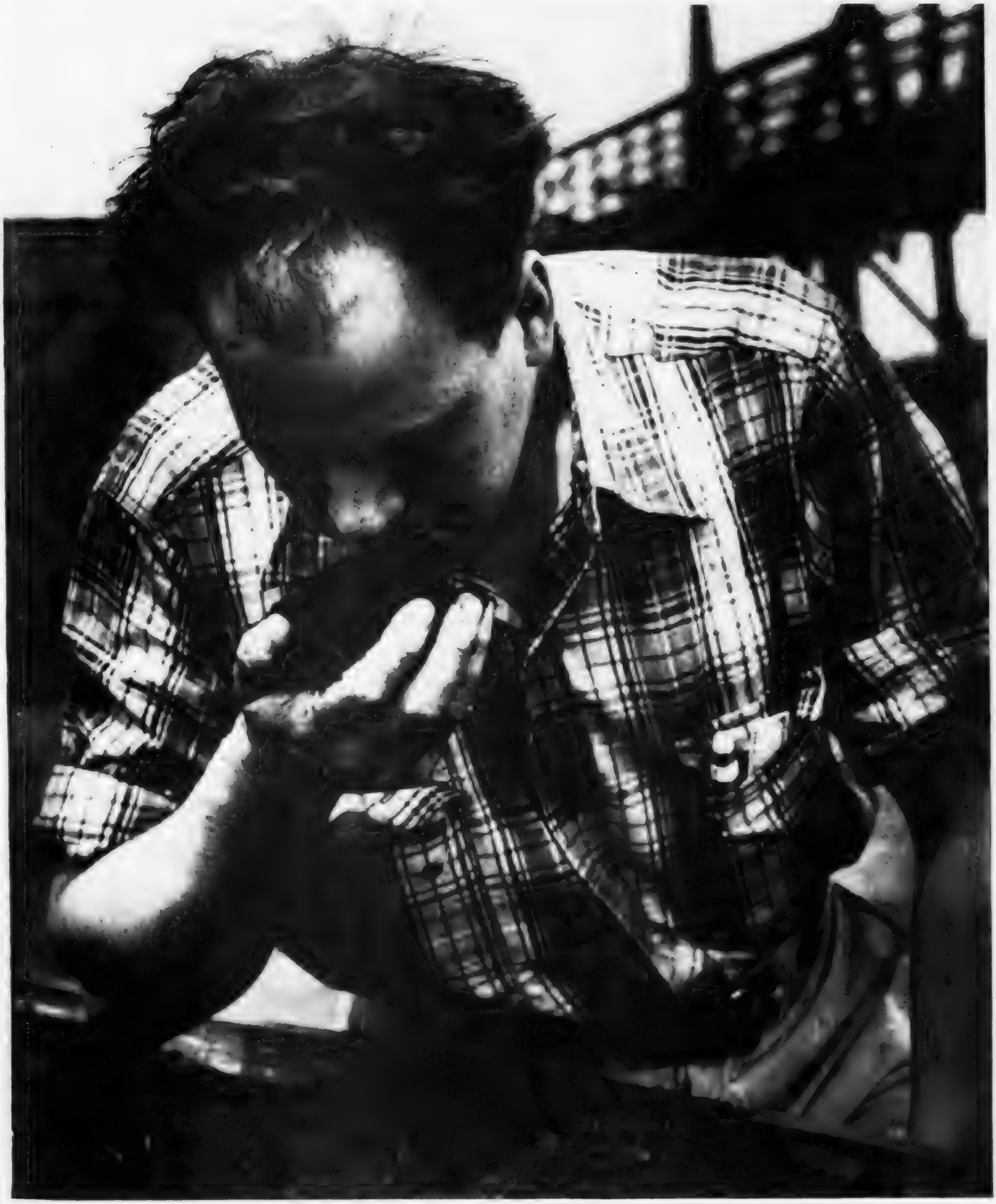
COMPOST is especially valuable on soils low in organic matter. It helps soil retain moisture tilth, fertility, and alkalinity.

LARGE SCREENINGS from the freshly made compost are dumped back into the digester as source of bacteria for the new batch.



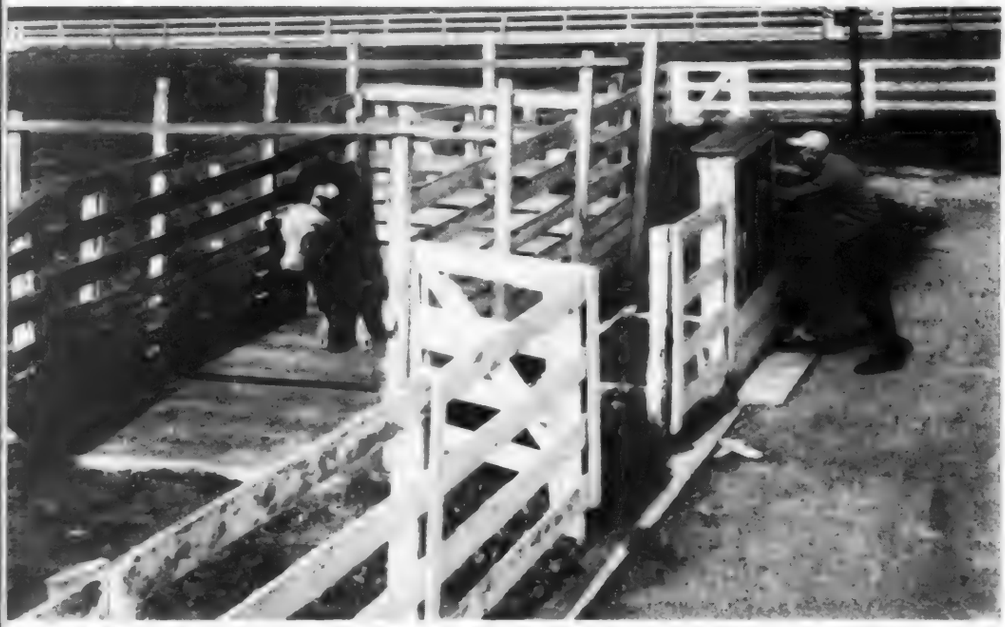


IN LESS THAN ONE WEEK stock yard manure and straw is turned into compost, a humus product filled with living bacteria, and capable of enriching soil. Compost is still produced in quantities too small for economical use on large areas, but industrialists promise lower prices with increased production. Thousands of cities in every part of the country have raw materials for compost in the garbage and sewage they collect. Only a few, however, are turning wastes into fertilizer.

BY BRADFORD KNAPP, JR.

BEEF BULL TESTING

Fast growing steers are the get of growthy bulls.
Bull progeny testing finds the blood lines
that produce economical, money-making beef.



AS THE BULL GROWS so will the calves he sires grow. The young bull on the scales averaged two and a half pounds gain a day during testing; his calves will be fast growers since half their inherited growth characteristics will come from their sire.

ON the high plateau range along the Yellowstone River in Montana a herd of purebred Herefords is proving that there is no relationship between the appearance of a beef animal and its ability to gain weight rapidly and economically.

Here at the U. S. Range Livestock Experiment Station at Miles City, Montana, a project has been going on for the past 14 years which may result in proven sires in the beef field as there are proven sires today in the dairy field. As a result of this work it may be that some day in the not too distant future a bull could be advertised as.for instance, the sire of 50 AR sons and daughters with records of 2.5 pounds per day gain in weight, himself the son of a sire of 120 AR sons and daughters of 2.3 pound records.

The object of this project is to determine what factors influence the rapid, economic growth of a beef animal. They are not out to prove that the old standard of selecting beef animals on appearance alone was wrong, but merely to test this standard against the ability to put on weight.

Charles Haigler and son of Washington Courthouse, Ohio, are Hereford breeders who have long suspected that their showiest animals were not nearly their best. "I once had a top show bull here," Haigler said, "a chunky, compact individual, but his get never gained as fast as the calves of a bigger,heavier bull that was not nearly as attractive from the point of view of the show ring. At first this was just a suspicion with me and then I began to test it out by weighing the calves at frequent intervals and keeping accurate records of their gains. It didn't take long to find out that the get of the bigger bull could outgain the calves that were sired by the compact type and that their get inherited the same ability right down the line."

Though Haigler had not heard of the government project at Miles City when he first started his private test, he was duplicating some of the work performed at the experiment station. Despite the fact that this project had all the earmarks of a revolutionary experiment, there was actually really nothing new about it. As a matter of fact, it was an experiment as old as the history of livestock breeding itself. Back in the Eighteenth century Robert Bakewell, the father of modern breeding methods, carefully tested his animals to check their utilization of feed. He discarded the poor doers and bred on with the thrifty ones. After the breeds and their respective types had become definitely established, however, the fair and the livestock exhibit became the proving ground of breeding stock. This has continued for the past 150 years. It has resulted to a large extent in a pattern of breeding cattle designed to please the eye of the judge with little consideration given to their ability to produce beef efficiently. The breeder and the judge have always assumed that their ideals and types of conformation were indicative of beef producing ability. From generation to generation livestock men have handed down the belief that an animal with a short, wide head, with great width of muzzle; a chest wide, deep and thick, slung between forelegs that are wide apart is a feed converter of top class. A roomy middle was believed to indicate feed capacity while the short,

thick body was the hallmark of the efficient producer of the high-price cuts of meat. The men who fathered the progeny testing project had no great disagreement with this standard. They merely wanted to test it. So in setting up the program they determined that the first line of research should be a correlation study to determine whether ability to make economical gains could be appraised by visual observation or by measurements. It didn't take too long to get the answer.

All steers at the Miles City Station were scored for beef type at the time of weaning and just prior to going into the feed lot. A committee of three competent and well trained animal husbandmen and livestock judges judged each animal individually and scored them independently of the other judges. The average score of the three men was used as the score of the animal on the basis of 100 for the perfect individual and 30 for the poorest. Points scored were scale, thickness of flesh, smoothness, character of head, width and depth of chest, depth of rear flank, width and straightness of back, thickness over loin, width and thickness over rump, fullness and depth of round and overall width and symmetry of body.

In time, 613 steers, the get of 83 different Hereford sires, were scored in this manner, placed on feed test, and weighed at regular intervals. The test disclosed definitely that there was no relationship between the scores and subsequent gain in the feed lot or with efficiency of gain while on feed. It is important to note right here, however, that this does not mean that the more common looking or undesirable animal can be expected to gain more rapidly or efficiently than the better type. It simply means that future gains or efficiency cannot be predicted from visual observation of the animal before the feeding trial starts. It was also found that both rate of gain and score were inherited characteristics, more or less independent of each other. This leaves the breeder free to select for rate of gain and this selection does not materially affect the type or conformation. And since these two valuable characteristics are not related,

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THE PAYOFF comes at the slaughter house. The grower is interested in the rate and economy of growth; meat packers are interested in the percentage of useable beef to waste matter. Both factors are inherited, but are not correlated.

Marshall Walters. and a few other farmers,
still place their faith in colorful, open-pollinated
Indian corn and hope for yields equal to hybrids.

Calico corn

CORN husking is usually just one monotonous ear after another, but not for Marshall Walters of Butler County, Ohio. Every ear that Walters sticks his huskin' peg into is a surprise package. He never knows what the next ear will look like, and when his crop is finally husked and piled on the floor of his barn, he not only has some good corn feed but a mighty pretty pile. His wife thinks his Indian corn is so pretty it's a shame to feed it to the cows.

Walters plants what he calls "speckled corn." because he likes it better than hybrid. His corn is the same kind the Indians planted for centuries. The corn the Indians grew ranged in color from deep maroon through yellow to white. The yellow grains were selected by the first white settlers and the common yellow dent, the popular variety before the hybrids came along, was developed. Today open pollinated corn holds out in only a few isolated spots in the mountains of Kentucky and Tennessee, and in the deserts of New Mexico and Arizona which still have no hybrid variety.

Through selection of the best and largest ears for seed Walters' "speckled corn" is almost as large as the hybrid corn his neighbors grow. It is sometimes called calico corn, or squaw corn.

Calico corn is still grown outside the mountains by a few farmers like Walters who says, "I have never found anything that does as well on my ground. Sure it's pretty," he adds, "but I don't grow it because it's pretty, I grow it because it's good feed and yields well on these hillsides. I planted six acres this year and I figure I got 500 bushels of corn. I didn't use fertilizer, except manure. I tried that hybrid corn here one year," he adds; "maybe it was the weather, but it didn't yield so good. It was so hard I couldn't feed it without grinding it. I grind this corn too for my milk cows, but for the horses I just chop it up. The bull will eat a bushel of it a day. Maybe I should try hybrid again, but I guess I'm in a rut." Walters doesn't care to hazard a guess on what his land would produce if planted to hybrid, but he admits that his speckled corn probably yields well, not because of his poor land, but in spite of it, and that speckled corn takes as much from the soil as hybrid does.

About the time the first heavy frost comes in autumn, Walters starts hauling his corn to the barn, a shock at a time. "My little sled will just hold about a shock," he says, "and by hauling it into the barn I can husk it where the wind isn't blowin' the snow down my neck. Huskin's a good winter job," he adds, "and I don't have to be in any rush about getting it finished."

His barn is about 25 feet from the state highway that cuts through his farm. After he has husked a few shocks, and the corn pile starts to grow on the barn floor, he begins to get visitors. "Women from town drive by," he points out, "and when they see the corn through the barn doors, stop to see if they can get a few ears. They use it for decorations. I always give them some. I never miss a few ears at a time. I remember one woman brought it back, after keeping it in her house during the holidays."

While Walters husks his corn he keeps an eye open for exceptionally good ears for next year's seed. There is a burlap sack handy and he occasionally drops a highly colored ear of corn into it. He chooses large ears for planting, and wants the grains to be large ones growing in straight rows and extending well down over the end of the ear. It doesn't matter what the colors are. "I don't try to mix the colors of the seed," he says. "I just plant what comes and take what comes." He ties the seed ears in bunches of 10 or 12 with a piece of binder twine and hangs them from the rafters in the basement.

Once in a while neighboring farmers decide to plant some speckled corn and come to Walters for seed. He doesn't want to sell his seed corn outright, but prefers to trade for an equal amount of regular yellow corn. When the yellow corn comes in, there may be only two sacks of it, but Walters piles it over to one side of his colorful pile of Indian corn, so they won't get mixed up. "Don't want to pollute this speckled corn," he explains.

Walters bought his 44 acre farm in 1925. "The land was so poor then it wouldn't raise a decent crop of poverty grass," he recalls. "I started to build it up and now it's in pretty good shape. There's nothing like cow manure to bring up a field."

Walters has heard of another farmer over near Normal, Illinois, who also raises speckled corn. His name is W. M. Arendell, and he raises most of his corn to sell. Women from Normal who want it for decorations pay a nickel an ear, and Arendell sells it for seed at five dollars a bushel. Walters has nothing against selling his corn for profit, but since he plants it for livestock feed, that's all he asks. "It's pretty," he says, "but I'll leave that side of it for other folks to think about. My cows and me have to be practical."

AT FIVE CENTS AN EAR W. M. Arendell (below) makes a good profit on his calico corn. Women from nearby Normal, Illinois, buy it for decorations during holiday seasons.

THE CROSSROADS GROCERY with its pot-bellied stove and open cracker barrel has grown up to this, Don Florea's Farm and Home Center.

COLOSSUS OF

BY TOM McCARTHY

THE old fashioned country store at the crossroads has made a comeback in southern Ohio, although Grandad might not recognize its streamlined modern counterpart of glass, steel, and slab concrete. Trade that by-passed the old-time general store with the advent of the auto and paved roads is moving back to the country to Don Florea's "department store in a cornfield" near Milford, Ohio.

Florea's Farm and Home Center, called the biggest general store in the world, stops the city-bound farmer and brings the city shopper to the country by offering free parking on its 49 acre lot and by piling on its shelves every known want of man.

A charred ruin in 1946, the Farm and Home Center has grown in three years into a multi-million dollar business with more than a hundred employees, who in addition to selling everything from safety pins to tractors, are engaged in such diverse pursuits as hog butchering and baby sitting.

One element of the old-time country store has been preserved intact—the tradition of neighborly service. Don Florea believes that sales follow service, and he knows from experience that farm customers never forget the help extended in cheerfully repairing a broken down milking machine at 2 a.m.; in helping to curb an outbreak of disease in a flock of chickens; or in making room for a cookie and cake sale by a rural Ladies Aid Society, even though it is in direct competition to the baked goods department of his own store.

Seen from Highway 28, Florea's merchandising mammoth dominates the open fields like the big top of a circus tent. Signs at the entrance drive announcing "This is it!" are almost up to the colorful standards of a carnival midway. And the cluster of poultry houses just across the drive from the main building have more than a passing resemblance to the traditional circus sideshows. Last year a live chicken with four legs was the star attraction. This year, "the most comfortable chicken in the Ohio Valley" is growing to plump maturity on balanced feeds inside a narrow necked bottle.

The poultry houses provide a continuing demonstration for farm customers of the worth of Farm and Home Center's feed recommendations in the raising of chickens. City customers are reassured by the presence of the poultry houses, since the egg counter proclaims its wares are only ten seconds away from the nest.

The incubator designed to hatch 60,000 chicks at one time vies for attention with the chickens that lay eggs with red and green yolks to demonstrate the importance of diet in poultry raising. But the big show is inside the Farm and Home Center's monolithic main building, with its acre of floor space and a half mile of grocery

FLOREA can talk farming to farmers; his approach to big business is as informal as his office appointments.

THE CROSSROADS

shelves. Tractors, galvanized wash tubs, wire fencing and watering troughs flank the entry steps like a guard of honor.

Inside the big glass doors, during the weekend shopping rush, customers crowd by stacks of unpainted furniture, the popcorn machine, and the open freezer units offering ice cream on a stick, so they can take their places with those waiting in line for a wheeled service basket relinquished by an outgoing shopper.

Some of the baskets are banded with red paint and are sterilized daily so that they may be used as a baby buggy for junior while mother fills the lower basket of the two-tiered contrivance with groceries.

This atom age country store boasts no cracker barrel and pot-bellied stove, but the conversation around the new model tractor, or over a soda in the big store's restaurant, is as old as farming itself. And the loudspeaker lends county fair atmosphere as it spills out the strains of a hillbilly ballad along with announcements of cut-price specials ranging from hard candy to corn pickers and water pumps.

The Carnival Touch

City and farm accents mingle with the falsetto of a lad hawking hot dogs, the hawker's spiel as he chants the virtues of vacuum cleaners and kitchen gadgets, and the screams of a wrestling crowd channeled into the store on a television set in the appliance department. Sometimes the confusion is compounded, as on the night before Hallowe'en last year when more than 100 women shoppers showed up in masks and costumes in order to qualify for free cider and candy.

Roughly half the floor space of the main building is devoted to the meat, grocery and produce departments, but strict departmentalization is the exception rather than the rule. A housewife shopping for canned goods finds herself suddenly confronted with odd lots of glassware, lamp shades, dog harnesses and sun glasses. The baked goods department and doughnut kitchen are flanked by a barbershop and the side of a house erected to demonstrate storm sash. Hardware, household appliances, toys, dry goods, new automobiles, and boots and shoes unchecked by any partitioning sort of flow together in the corner of the store which opens on a garage where a customer may have his car serviced while he shops.

Farmers with feedlot mud on their overalls push through the crowds to dicker for an automobile or an electric refrigerator with a load of hogs or a couple of steers as down payment. While the farmer unloads his livestock, his wife shops for house dresses, and his youngsters eye the fishing rods and baseball equipment adjacent to the refrigerated cases displaying freshwater catfish, live oysters from Vir-

ginia and lobster tails imported from Australia.

Behind the 90 foot long counter offering cellophane-wrapped meats and poultry, giant refrigerator doors open on 2,300 frozen food lockers where farm customers may store the meat from their own livestock after it has been slaughtered, cut up to order, frozen and wrapped for a processing charge of a few cents a pound.

Food locker users from the city are invited to buy a whole hog or a hind quarter of beef at a wholesale price so they can enjoy choice meat from livestock raisers who bought their feed from the Farm and Home Center.

Meat is the Specialty

When hogs sold at $17.00 a hundred weight on the market, the cost to Farm and Home customers was 25 cents a pound for a whole hog, slaughtered, chilled, cut to order, with the lard rendered, sausage stuffed, the hams and bacon sugar cured and hickory smoked, and the fresh meat frozen. The fresh pork is wrapped in meal-sized packages for storage in a food locker rented from the Farm and Home Center.

Buying its meats and poultry from farmers following the store's own feeding program, the Farm and Home Center boasts of a "quality control" that begins on the farm and is carried through its own meat processing plant which can handle 600 hogs, 125 cattle, or 10,000 chickens a day.

Meats and poultry are sold on a money-back guarantee. Of 40,000 turkeys sold since the plant opened three years ago, less than a dozen have been returned by customers claiming dissatisfaction.

Shoppers are invited to watch the slaughtering and butchering in the rear of the store, which last year processed 2,500 cattle, 6,000 hogs and 100,000 poultry. These figures are still far below the theoretical capacity of the plant, which boasts machinery to automatically dehair a hog in 45 seconds, and to remove the feathers of 300 chickens an hour.

The thermostatically controlled smokehouse can take 400 hams at one time. Young green hickory logs cut from the store's own woodlot are used for smoking. Lard is rendered the slow, old-fashioned open kettle way.

This new style country store has a roof especially constructed to channel rainwater into cisterns of 250,000 gallon capacity, a water supply sufficient for a town of 2,500 people. The store's own sewage disposal system is large enough to accommodate a

TOP TO BOTTOM TO RIGHT: Competing with Florea's own bakery, ladies of the church have a cake sale in a corner of the store.—Stock feed problems are answered by Florea himself.—Customers wanted a barber shop; they have it.—Free pony rides for the kids keep them out of mischief.—The housewife's nose knows the genuine hickory smoke.—Maybe he can take a day or two off when the corn is laid by.—A customer's hog is tagged on its way to the locker.—A conference on which color would go best with the wallpaper.

FARMERS go to Florea to ask when to plant and when to sell and what ails a sick pig. Farm management is free to customers.

village of 1,000 people. Traffic through the store in a single day exceeds the 3,000 population of Milford, the little country town a short distance away.

The Ingenious Florea

Florea is a resourceful fellow. When the building was being constructed postwar shortages of drain pipe threatened to halt the project. The contractors advised Florea to give up the project. His response was to locate a soil pipe plant in Alabama which had men and machines to make the pipe, but none of the vital scrap metal needed for the job. Somehow Florea rounded-up enough scrap in Ohio to fill two huge trailer trucks. He sent the truck drivers south with the loads, along with instructions to park at the plant until the pipe had been made, then load it and bring it back to Ohio. Work continued on schedule.

He has a quick solution for the day-to-day problems that beset his store or his customers. When mothers complained they didn't know what to do with their children while they shopped, Florea trotted out his own children's ponies and entertained the small fry by giving them pony rides. To put the baby sitting act on a really efficient basis he erected a tent and installed a television set to entertain the youngsters while they munched free candy. With that set-up one employee only was needed to ride herd on a tent-full, and the mamas shopped in peace.

A suggestion box inside the main entrance is partly responsible for the wide variety of merchandise and service. Customers asked for a barbershop, and they got it; some thought a one-day dry cleaning service would be a convenience, and it was arranged.

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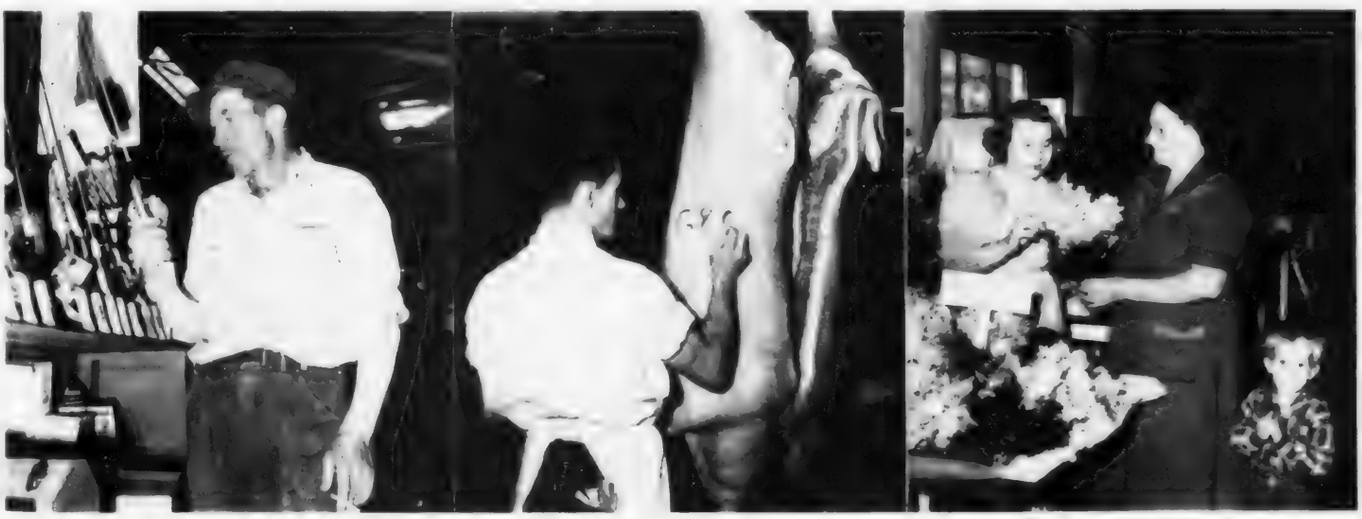


WHEN HIS SOWS are farrowing Stevenson lives around the clock in the hog house.

Ton Litter Production

BY ARTHUR EDWARDS

IT wasn't so long ago that a ton litter was a front page story; with a great deal of labor and expense a few farmers each year made the select group. Today a ton litter is not rare, but a hog man who can turn them out regularly as part of his program is rare.

J. Ward Stevenson of Nodaway County, Missouri, is the rare one. He raises ton litters as a business. He says he wouldn't be raising hogs if he couldn't make his litters weigh at least a ton, because that's where the big profits are.

In fact, not long ago when he set a new record for the heaviest litter of nine pigs in the National Duroc Association contest, he was surprised when the association notified him. He hadn't been shooting at the record; it was routine for him to qualify his Durocs in the association production registry field. His heavy litter of nine pigs weighed 2557 pounds, an average weight of 284.1 pounds per pig at 180 days.

There's no secret formula for raising ton litters and Stevenson believes anyone can do it. But he admits there are several musts in the business. These are simple things, but every farmer who raises ton litters recognizes that they have to be followed. Perhaps some of their methods may differ from Stevenson's, but they all point toward good care and management.

Stevenson believes in getting his litters off to a good start. This is shown by a glance at the history of the 51 litters which he has qualified in the production registry contest held each year by the United Duroc Record Association. Sows have to wean a 320 pound litter of at least eight pigs at 56 days of age. Gilts under 15 months age have to wean a 275 pound litter of at least eight pigs. Stevenson's 51 litters, a good percentage of which were gilts, averaged 298.5 per litter at two months age.

These sows farrowed an average of 11.96 pigs per litter and weaned 9.23 pigs. And that is where the profit in hogs lies, Stevenson says. He figures it takes the first five pigs in every litter for operating costs.

As a rule he handles about 40 brood sows in the spring and 30 during the fall farrowing season. Those which save eight or more healthy pigs and are of superior type and quality are entered in the PR contest. Stevenson is particularly proud of his weight records for the paying size litters, that is, litters which consistently run 8 to 10 or even 11 strong, healthy pigs. Runts have no place in his program, and the few that are born in his litters are immediately destroyed. He gets rid of sows which throw too many runts and squealers.

Important as feeding and management may be, Stevenson says you've got to start with good hogs. He isn't too set on any one breed or on using crosses as long as the hogs are the right type. He formerly used cross-bred hogs. He has crossed Polands and Durocs, Durocs and Berk-

RINGOLD LADY DORA and her 9th Production Registry litter of ten pigs. They weighed 369 lbs. at the 56-day weaning period.

the sow off into a gutter. This is supposed to keep the bedding dry, but actually, he says, sows will urinate on the high side. Then, as the floor drains, more bedding is saturated and has to be changed more often. However, he does locate his pig brooders and guard rails in a high corner. This insures dry bedding at all times for the litter.

Stevenson has worked out a routine which he follows during farrowing. He places a tub or bushel basket over the guard rail and brooder. In cold weather,

shires, Polands and Hampshires and Durocs and Chester Whites. And Stevenson says you can get results with these provided you start with quality stock. From his own experience he is firmly convinced that the cross doesn't materially help the quality of the offspring. That's why he decided about 10 years ago to stick with his purebred hogs.

His son, John, wanted a purebred litter for his 4-H Club project. Three Duroc littermate gilts farrowed the same night. Two gave birth to 10 pigs each and one to 12. One litter was crossbred and the others purebred Durocs. At 56 day litterweights, the purebred litters averaged 53 and 54 pounds per pig and his crossed pigs only 37 pounds. The difference at market time was considerably bigger. This, he said, convinced him that he could make more by handling purebred stock, especially if it opened a market for breeding stock.

Using one breed of stock also pointed the way to more careful selection, which Stevenson says is very important. He avoids coarseness in his breeding stock, especially in the selection of a boar. This, he says, pays dividends with market hogs. For example, if he keeps more boars than breeders demand, these can be castrated and will sell as barrows on the market.

Recently he sold 21 fat barrows at market weights ranging from 300 to 400 pounds. Fifteen of these 21 had been castrated at weights of slightly over 300 pounds. Though they were not completely healed, every one sold as a straight bar because they lacked the normal staginess. One old boar also sold as a stag though Stevenson was on hand to explain to the commission man that he was a boar. Of course, the packing house caught the mistake, and the hog was paid for at the going market rate for boars. But he says it shows what selection will do.

He picks boars with light testicles and small shafts and breeds for this. There is much more to this than the appearance of stags. Daughters of boars which are coarse and carry heavy testicles and large shafts will consistently have heavy rear udders. His experience shows that heavy rear udders usually go bad after a litter or two. And market bars of this type carry excess rear belly fat which hurts their apearance. Stevenson much prefers that his market bars be trim in appearance. And he never buys a sow, gilt or boar with inverted nipples. He has had only three sows which came up with inverted nipples in his hog experience. None of these were ever kept for breeding purposes. He wants at least 10 good teats, since a sow usually won't raise more pigs than she has teats. Stevenson doesn't believe in inbreeding either, preferring to use outcrosses carefully selected from reliable breeders. They are available all over the country, he says, and by looking around you can find them without going too far from home.

With this type of stock on hand, raising ton litters becomes a problem of management and feeding. You have to be adept at both, Stevenson says. A glance at his operations will bear this out.

During the heavy farrowing season, usually during March for spring litters and September and early October for his fall pigs, Stevenson practically lives with his brood sows. He has a well heated office in his colony house equipped with a bed and desk so that he can catch some sleep as well as keep accurate birth records and keep a close eye on the farrowing.

All sows farrow in the colony house. "Older sows need attention during farrowing as well as young gilts. My mature sows are large and can flop over on several pigs or a litter and mash them before the sows realize it," he says. And in a colony house sanitation is easy to control.

PIGS are hand-fed twice a day.

Since sanitation is a very integral part of his management program, Stevenson follows a set procedure. Every pen is thoroughly cleaned and disinfected between litters. The concrete floors are cleaned first with a shovel and broom. Then they are hosed down and scrubbed. After this, they look clean, he says, but it takes a lye water treatment to complete the job. He uses one-half can of lye in 2½ gallons of scalding water for each floor. This is sprayed on with a 2½ gallon pressure hand sprayer. Once on the floor, it sets for an hour and the floor is again hosed down. The lye boils out much additional foreign matter, Stevenson says, and literally sterilizes the floors.

He is a strong advocate of concrete floors because they can be thoroughly cleaned in this manner. But Stevenson doesn't like sloping floors, which in theory should drain spilled water and urine from

FREQUENT MOVING of hog houses to clean ground and fresh pasture is an important health factor.

Stevenson has worked out a routine which he follows during farrowing. He places a tub or bushel basket over the guard rail and brooder. In cold weather, the brooder light is simply raised and hung over the tub. As the baby pigs are born they are placed in the tub until several hours old, when they are dry. Then he lets them nurse. Constant care in handling his sows keeps them gentle. He can work around them during farrowing without getting them excited. He prefers using the tub to a bushel basket because it is larger and also because pigs cannot get out of it.

Pigs are kept in the colony farrowing house only about one week. When kept here longer they fail to do well and sometimes scour. Stevenson attributes this to a lack of some mineral. He says that putting dirt in the house would probably allow him to keep them in it longer. But this runs into extra work and with his particular method of management, he considers it unnecessary. At two days to a week, depending on the weather, his litters are all moved to individual farrowing houses on clean ground. These are not equipped with brooders, but do have guard rails to protect the pigs.

Two Litters to An Acre

By clean ground he means pasture where no hogs have run for at least two years. Such an arrangement solves the problem of worms and disease in his hogs, though he does double treat all hogs for cholera. Each year he makes new seedings of alfalfa. An acre will easily carry two litters and sometimes more, he says. Stevenson maintains that you simply cannot raise ton litters on old lots. And he believes that alfalfa pasture is the best that can be grown for hogs.

His hog herd has free access to alfalfa pasture every day of the year that snow doesn't cover the ground. There is always a growth of three or four inches during the winter and the hogs will pick at this. He sometimes feeds a little good quality alfalfa hay during inclement winter periods. "But my hogs will seldom eat much of it," he says, "because they run regularly on the pasture."

Pasture and minerals figure heavily along with a quality grain feed in Stevenson's feeding program. He buys only the best quality and mixes all his own. "I'll pay a nickel more a bushel to get quality corn," he says. And he sometimes has to do this, since he has cut down his corn and other acreage of cultivated crops on his 338 acre farm. An additional 183 acres have been sold. He said that good help was hard to get and that he prefers working more with his livestock.

When buying oats and wheat for hog feed, Stevenson has a set rule. Oats must weigh at least 36 pounds to the bushel and wheat 60 pounds. He buys tankage and mixed minerals, preferring a cheap mineral to the more expensive and complete minerals. A cheaper mineral made by a reliable firm contains the necessary nutrients, he believes. He relies on good pastures to supply the bulk of mineral needs. When he can buy meat scraps on the market at about the same price of tankage, he does so. Dried buttermilk is also a popular feed with Stevenson.

In the prenatal stage his sows and gilts run on alfalfa pasture and get a mixture of equal parts of shelled corn and oats. To this is added tankage and mineral. After the pigs arrive and are placed on pasture with the sows, they are creep fed from the time they are three weeks of age. It is at this age that they will begin to eat good. Their creep ration consists of equal parts of ground shelled corn, oats and wheat, tankage up to five per cent of the bulk, and five per cent dried buttermilk.

Once the pigs are weaned and separated from the sows, they get this same ground feed mix along with all the shelled corn they will eat. As they gain and grow into the shoat stage, Stevenson gradually slackens the amount of the ground feed mix, increasing the corn. They run on quality alfalfa pasture at all times. He never slops his hogs, believing that it puts too much belly on them.

All Hogs Hand Fed

Stevenson has a method of feeding which he follows with every hog on the farm. They are hand fed the amounts that they will clean up twice daily. He says that when he eats between meals and at odd times of the day, his own stomach is never settled—it rolls and he is never comfortable. So he reasons that hogs are the same. And his ton litters bear out the fact that regular hand feeding pays.

Pigs are usually weaned at seven weeks, but some of them stay with their mothers up to eight weeks. Stevenson says he tries to wean them in groups, but that most are on their own shortly after they are

seven weeks of age. Then he can get the sows bred again for another litter.

A slightly different marketing program is followed by Stevenson than is followed by most commercial hog men. Since he has an unusually large demand for breeding stock, especially bred gilts, he doesn't try to hit any one market. About half of his hogs are sold as breeders.

The better gilts in the crop are bred and future boar pigs selected. Market hogs are pushed for early market weights, the weights being somewhat heavier than is common. Most tip the scales at 275 to 300 pounds per head. This means he sometimes gets about a quarter cent less than top on the market, but since he gets such good gains from pasture and careful feeding, he believes it pays to do this.

Nor does Stevenson breed his sows so they will all farrow during a short period. He regularly supplies bred gilts to buyers which will farrow in February, March and April and comparable fall months. Actually, he prefers that the hogs he will feed out as breeders or for market come during January. He says it is a better month because he can usually count on better weather. February and March are hard months because of the unusual weather changes. Market hogs are sold when they are ready.

That rigid management and feeding have paid off for Stevenson can be seen from his record. He has developed the only three star and two star Production Registry boars in the United States (January, 1950 Duroc News). A number of one star boars have been developed, but even these are limited. Waveland Leader 3rd, Stevenson's three star boar, was recently retired from service, but his two star boar, Orion's Dream, is still in service.

A PR boar has to sire 15 PR qualifying ton litters. Then for each star a boar needs five 2 star daughters or 10 one star daughters or any combination which adds up to 10 points. And that adds up to a lot of ton litters.

Formula For Ton Litters

These business methods might be set down in a formula. And while they may vary slightly from farm to farm, they could spell consistent production of ton litters for any farmer. A glance back over Stevenson's management program shows that—(1) You've got to start with good hogs, the breed or cross not being so important as the individuals, (2) Sows and pigs need good care and attention at farrowing if a maximum number of pigs are to be saved, and they need to be taken from the colony house within a week, (3) Every pen needs disinfecting with lye water between litters for sanitation, (4) Sanitation is essential, (5) Clean ground and pasture where no hogs have run for at least two years, is necessary, (6) You need quality grazing, preferably alfalfa pasture, so the whole herd can have year 'round grazing except when snow covers the ground, (7) Feed only quality feeds with plenty of mineral and tankage, (8) Hand feed, twice daily, all that the hogs will clean up, (9) Creep feeds pigs from three weeks of age until weaning.

These are the main points which Stevenson believes are necessary in raising ton litters. He says, "Anyone can do it." And his record for producing ton litters shows that his methods, though simple, do work.

Serious and successful hog men like J. Ward Stevenson know such celebrities as Elsie the Cow and Man of War, but to them Ringold Lady Dora and HR Lou 7 are far more interesting animals. Ringold Lady Dora and HR Lou 7 are super-sows, and each has valid claims to the title, "Queen of the Hog World."

Ringold Lady Dora is the only sow of any breed to have raised nine litters of pigs to qualify for breed production registry recognition. She is a Hampshire and her home is on Meadowlark Farms, Inc., Sullivan, Ind. She is now past seven years old, an ancient lady as sows go and far-

(Continued on page 120)

Longhorns

When the lean and leggy Longhorn disappeared behind the pages of history he left behind the legend of sagacity, toughness and endurance that has snowballed into an amazing myth in our time. Just as his contemporaries of the wild and woolly west, Wild Bill Hickok, Buffalo Bill, and other heroes have become storybook supermen, the Longhorn has become a fabulous animal, a peerless critter dwarfing in every way our soft and pampered modern cattle.

But endowed, as he has been in popular misconception, with all the virtues of a super animal, the sober and unadorned truth about the Longhorn is as amazing as any of the tall tales. He was in fact an empire builder, a pioneer, and an animal of exceptional parts; he was the foundation of the original cowlands of America, a wild scalawag that dominated his range and became its economic salvation.

Personally, the Longhorn was self made. He sprang full blown from the canebrakes and mesquite; he was his own geneticist, exercising his own selection and fitting himself for the hectic battle for survival on a rugged frontier. He achieved stature and character without benefit of human attention, but no more perfect animal for his life and times could have been bred by science.

In many ways he was a throw-back. On one side of his family were the Spanish cattle, "the little black cattle with needle-sharp horns," which in turn sprung from ancient Egyptian and Asian stock. Here is probably where he gets his long horns. Part of him came from the bulls and cows which trailed the covered wagons from the East. He had hybrid vigor, and he certainly needed it.

The history of the Longhorn began with the settling of the uncharted Southwest. Andalusian cattle were introduced into North America by the Spaniards in Florida, Baja California, New Mexico and Texas during the 16th century, but it was not until the 1700's that they built their chain of missions and forts in Baja California and Texas. They brought along their black Spanish cattle. In those days of fenceless pastures and Indian raids, it was inevitable that some of the little black cattle would stray into the wilderness. The weakest died or were the prey of wild animals; the strong survived and were the origins of the innumerable herds of wild cattle in Florida, New Mexico, Texas, and California. They developed a fierce cunning. The savage, sullen, terrific endurance of the mustangs and cimarrones, as they came to be called, gained for them the name of outlaws.

These were not yet the Longhorns, but wild Spanish cattle, sharpened and tempered by their battle for survival. They were fiercer than the most savage buffalo bull; they were "big game." Anyone could eat meat if he could shoot straight enough to hit a cow.

Though the domesticated Spanish cattle from Baja California cut a wide and memorable path through Upper California, and, like the Texas Longhorn, built a cattle empire in the days of the Dons, they changed but little in character and size in the course of the years.

The Longhorn was a Texas product. Here the wild Spanish cattle were faced with an even more rugged geography and environment, and their predatory enemies were fiercer and more numerous. It was here that they received an injection of domesticated Eastern cattle. Stray bulls and cows, predominately of the Shorthorn breed, joined the wild herds, and bingo—after crossing and recrossing, out came the wild-eyed Longhorn. He developed into a fixed breed; he bred true.

BY FAYE BENNETT

It is not known how long it took the Longhorn to emerge from this union. Between the Mexican and Civil Wars, with one or two brief interludes, cattle were neglected in Texas for other matters. While men were settling the status of the state with bayonet and six-shooter, the Longhorn was in the making in the seclusion of mesquite and chaparral thickets in the lush river bottoms.

Nobody knows why the Longhorn went so much to horns. Their forebears from the East were horned, but modestly so; their remote ancestors from Asia and Egypt owned longer horns, but nothing like the elegant equipment which the Longhorn eventually sported. Perhaps the long horn was a recessive characteristic in several bloodlines, and doubled up in the Longhorn—or perhaps Mother Nature thought them up in one of her lighter moments.

In other ways, too, Longhorns were a distinct departure from anything in their ancestry. Hybrid vigor made them heavier and rangier and they came in a variety of colors. No two were alike; colors ranged from plain to fancy combinations of dun, blue, brindle, red, line black, cream and spotted. They could run like a deer and fight like a panther. They lost completely the placidity of their domestic relatives, but retained and even improved upon the fierceness of their wild kin.

The long, sullen face had a sinister look, and the eyes were cold and calculating. Their long legs took them great distances for water; like camels, they could go for days without a drink. Often they traveled 25 miles from bedding grounds to waterhole. They ate anything; they ate the harness from burned-out wagon trains, the bones of the Mexican dead after the battle of San Jacinto, cactus, and some say, rattlesnakes.

Rawhide and Steaks

By 1835, with more than a century of development back of them, the Longhorns had done well. With only the forces of nature and an occasional animal killed for beef to keep their numbers down, they multiplied prodigiously. There was tenuous ownership of the herds, but unbranded thousands roamed the river bottoms between the Nueces and the Rio Grande and the valley of the Brazos. There were six cattle for every person in Texas; there were so many Longhorns in Texas that a steer could be bought for $4.00. This was hardly enough to make it worthwhile to round them up and brand them: most of the herds were left practically unmolested to multiply and extend their range.

But here and there and from time to time practical men made the most of this abundance. Rawhide was used for everything: saddles, lariats, whips, clothing and furniture. Beefsteak was served three times a day, fried in "taller." There was a tremendous hide and tallow trade. The cattle were slaughtered, stripped of their hides and tallow, and the carcasses left for the vultures and coyotes. Hides brought 65 cents each. Indians raided the herds by the light of the moon, and gun totin' cattle thieves drove their loot silently away up the hidden arroyos. But in spite of all this, the Longhorn prospered and multiplied.

The Cattle Booms

Although there had been cattle drives before the end of the Civil War, they hardly made a dent in the Texas Longhorn.

Previous to the middle 1840's, small herds of cattle had been driven overland to Shreveport, Louisiana, to be shipped in flatboats down the Red River and the Mississippi to New Orleans, then the largest market in the South. In 1846, a herd was driven through Missouri to Ohio.

The Gold Rush in California, beginning in 1849, created a fabulous market for cattle. Money, or what was better, nuggets and gold dust, was plentiful. When the news reached Texas that a steer would bring up to $300.00, the cowmen invaded the thickets and the brambles of the river bottoms for the meat to supply the hungry gold rush camps.

The first drive to California was made in 1850. Two years later, thousands were headed west. On the long and hazardous drives over deserts and mountains the Texas Longhorn proved his mettle. With incredible stamina he made the long stretches without water, climbed the mountains, swam the streams, and maintained his vitality.

These western drives were interrupted by the Civil War. Texas joined the Con-

IN THE MESQUITE AND CHAPARRAL thickets of Texas the Longhorn made himself what he was when he ruled the ranges, a fixed breed from Spanish and English stock.

IN COLOR the Longhorn ranges from solid colors of red and white to stripes, dots, brindles, and pinks. It takes him up to 15 years to grow a full-length pair of horns.

federacy and many a tall Texan left to join the ranks. With the exception of beef for home consumption and the occasional herds driven overland to supply the Southern Army, the Longhorn was again left to himself. One of the most memorable overland drives of Confederate Army beef occurred in 1862, when a herd of 1,000 Longhorns was forced to swim the Mississippi River where it was at least a mile wide.

When the war ended the weary soldiers returned home with nothing but worthless Confederate money in their pockets. All they had was cattle, but they had plenty of those. Northern and Eastern markets were clamoring for beef. Chicago, Kansas City and St. Louis had the railroads; Texas had the beef.

The Trail Drives

And to the railroads went the Longhorn; the fabulous trail drives were on. The Chisholm Trail, with its feeder trails, from Texas to the railhead at Abilene, Kansas, became rutted and worn from the hooves of 10,000,000 Longhorns which traversed it from 1866 to 1890. Other lesser trails spiderwebbed out of Texas, the Oklahoma Panhandle, and the Southwest, to the railroads.

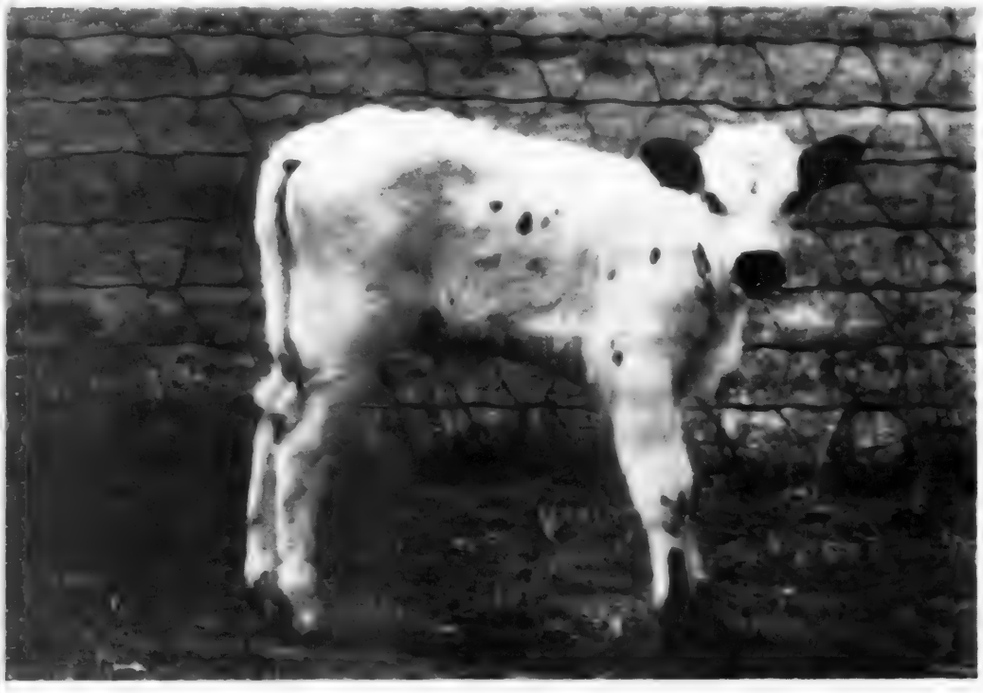
Those were lusty days in the cattle country. Cowhands, with a full head of steam generated during the three months on the trail, cut loose when they delivered their herds at the yards. They unlimbered their six-shooters, the trademark of the times, and shot one another and the necks off the bottles behind the bars of the all-night saloons.

The nights in the railroad towns echoed with the sound of gunfire, the screams of feminine entertainers, and the curses of men full of raw whiskey. Speculation and gambling were rampant; fortunes were made and lost by the cattle barons and dukes, lost at the poker tables in Abilene, made on the next drive to be lost again.

A Longhorn steer which cost $8.00 to $10.00 in Texas brought $28.00 to $30.00 at the railhead. Herds ranged from 300 to 3,000; some counted 5,000. The cost of driving was often as low as a dollar per mile per herd.

The herds made about 15 miles a day, but could do 30 if pressed. The Longhorn, unlike his more civilized relatives, did not bunch up on the trail, but strung out. To keep the strung-out Longhorns from breaking into a trot on the trail, cowboys had to ride on all four sides of the herd. At night a shout, the sound of a thrumming banjo, lightning, ground squirrels, an eagle, or just nothing at all, could set off a stampede. Riders were often trampled to death. There were no bridges and no ferries and after the first herds had passed in the spring the grass was down to the roots. But, somehow, the Longhorn foraged along the way and arrived in surprisingly good condition.

Chuck wagons carried the bedrolls and simple rations of the trail bosses and cowboys. Steak three times a day with beans and sourdough biscuits made up the sumptuous fare. A spade was necessary equipment—cattle rustlers, brawls, and the rigors of the trail made gravedigging one of the accomplishments demanded of the cook.



THE LONGHORN is not pretty when he grows up, but as a calf he is a cute package.

The Longhorn passed away as the result of no single affliction. There were complications. Certainly his long horns (a six-foot spread was very inconvenient in a box car), the settling of the West and the demand for better beef in Eastern markets all had a hand in doing him in. However, if these things supplied the *coup de grace* which ended his reign, barbed wire wound his shroud. By 1888 he was singing his swan song.

The invention of barbed wire changed the methods of raising cattle on the ranges. It permitted more attention to breeding, a closer and better supervision of the herds, and the seeding of the ranges to better grasses. The Longhorn, the product of an environment concocted of equal parts of cactus, rattlesnakes, rocks, raiding Apaches and rustlers, lost out when barbed wire brought in the Hereford and other breeds with faster and more economical gains and better eating qualities. In the last analysis, the Longhorn was good for about everything but beef.

The singing cowboy joined up with radio or went to Hollywood, and the Longhorn ambled into limbo. His polished horns repose above the fireplaces of the cattle kings of today or adorn the bars of western saloons; but his bellow is no longer heard in the land.

The Longhorn is today rarer than the buffalo. Just before it was too late, the

Government collected some last remaining specimens and sent them to the Wichita Mountains Wildlife Refuge near Lawton, Oklahoma. Here are 300 of the critters, all "purebred." Some private ranchers maintain small herds; some are owned by circuses. The Longhorn has no future except as a forlorn inhabitant of a zoo, or as a curiosity.

Specifications

The Longhorn did not reach maturity before seven or eight years, but he was good for a decade or two after that. Both bulls and cows kept on producing at ages far greater than other breeds. The maximum length of horns was not achieved until well after maturity, at 12 or 15 years of age. Cows and bulls wore modest horns —it was the steer which produced the king size. The record spread was a little over nine feet.

There was little use for the horns on the Longhorn's native range. They made good hatracks, passable furniture, and they were fine for ceilings and walls of adobe houses. They were cheap sources of glue once they got to the packing centers.

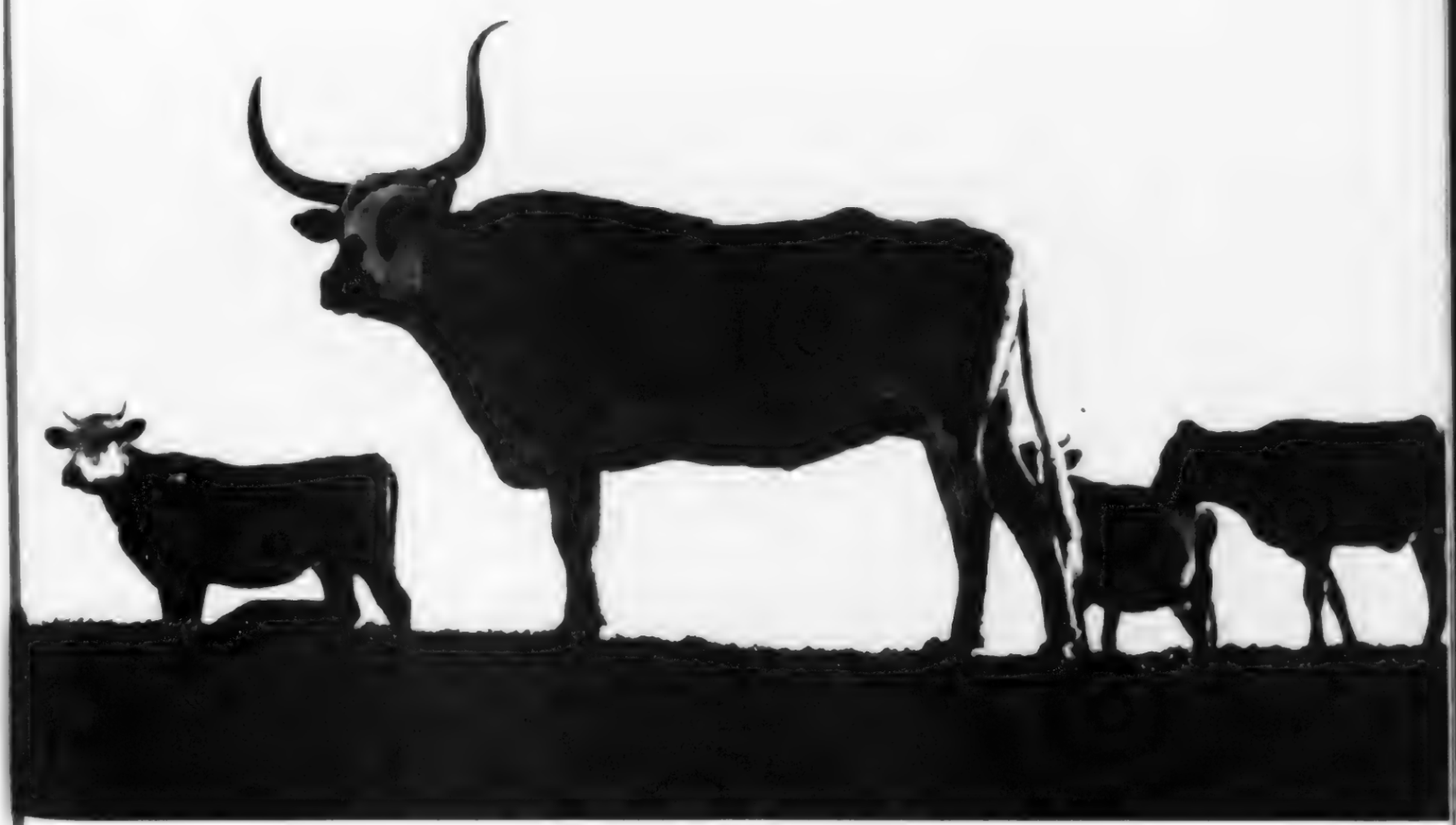
The size of the original Longhorns varied with his geography. Those from the Gulf Coast and Mexico rarely weighed more than 500 pounds. The Texas animal went to 1,200 pounds. If fed on good grass he might reach 2,000 or better. The majority of steers which went down the Chisholm Trail weighed from 800 to 900 pounds.

The Longhorn ranged from California through the Southwest to Florida, and in later years, as far north as the Dakotas. However, his greatest range was Texas. A few were tried in feed-lots, but failed to do well, perhaps victims of claustrophobia.

After the profit motive came into Longhorn management, the bull calves were castrated at roundup time and branded, but in the wild herds there was an oversupply of eligible males. During the mating seasons their bellowings and brawlings were epic. Occasionally brave souls made an exploratory try at milking a Longhorn. This was not successful. The hazards were great and the milk return scant and anaemic.

Once the Longhorn had established the West as cattle country, his mission was done. Like the sixshooter, the horse and buggy, and whalebone corsets, he had to step aside when progress brought other and better adornments for our American civilization. But he built an empire, and tough and ornery as he was, he commands our respect for the rugged virtues which he possessed in such full measure.

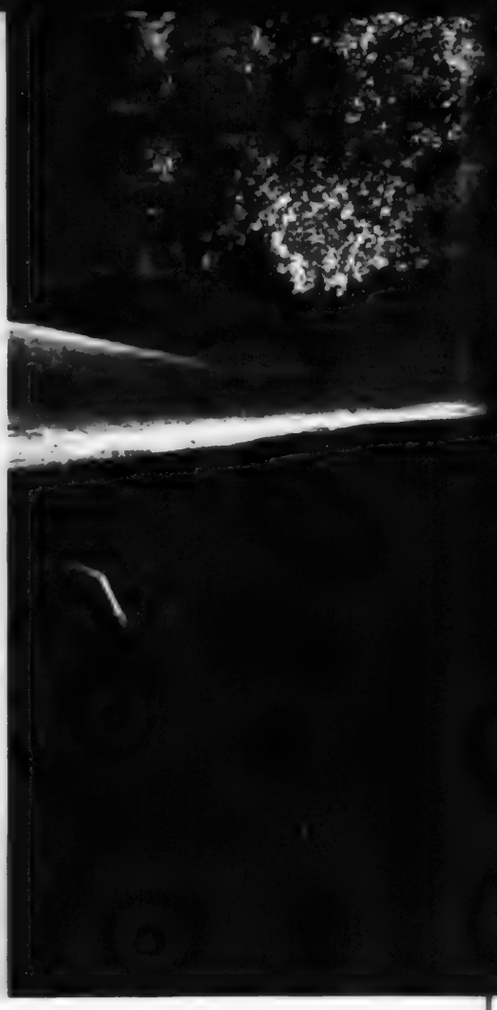
THE RANGE of the Longhorn extended from Texas northward to Montana and east to Florida. This steer popped up among a Hereford herd on a Louisiana levee.



BY JOHN I. SMITH

Stretching PASTURE

Cornbelt farmers are working toward all year pastures. The experts say, "It's possible."



SINCE the pioneer farmers touched the points of their sod-breakers to virgin prairie lands and turned the roots of vast acreages of grasses to the sunlight, we have never had all the grass crops we need to produce meat and milk inexpensively. The pasture which the farmer kept was maintained with nothing but a fence. A pasture was any field not used for something else. Pasture was not regarded as a crop. After a few weeks in the spring it was little more than an exercise lot, providing just enough grass to keep a cow from starving.

We have often heard the verdict of the farmer who says, "I'm going to plow that pasture next spring and plant it to corn. It hasn't been plowed for 25 years and it should raise a whale of a corn crop." But it is probably one of his poor fields, for each year during the preceding quarter century it has yielded a crop of beef or milk with nothing returned to the soil but droppings. Within recent years, we have learned that pasture can be a money crop, producing more net income per acre than grain.

We're learning how to build better pastures with fertilizers, the proper mixtures of grasses and legumes, and how to harvest

THE SEEDING MIXTURE for permanent pasture should contain both grasses and legumes. Bluegrass and white clover, ladino and brome grass, or redtop and lespedeza are good mixtures for Midwest pastures.

the resulting crop to best advantage.

Once we had discovered the actual cash value of good grass we began to explore the possibilities of having pasture over longer periods of the year. Today all over the country, experiment stations, state colleges, farmers, and commercial manufacturers are looking for new and better ways to stretch pasture as close to all 12 months of the year as possible. And the exciting part of the story is that each year we seem to be coming closer to solving this problem. Now there is a real promise of year 'round pastures even north of the Mason-Dixon Line.

The man who is watching this new trend most carefully is the farmer, for he stands to gain the most from it. When he can offer his milk cows and his meat animals green grass during the hot mid-summer months, and through most of the winter, his milk check will look healthier.

Along with the fame that comes from growing 200 bushel corn the farmer is now getting, in some quarters, credit for producing big pasture crops. Clyde Wachter of Broken Bow, Nebraska, recently won honors for his wise use of pasture in milk production. He milked 18 grade Holsteins and during the seven summer months produced 140,975 pounds of milk. He accomplished this by stretching his pasture season with the proper grasses and legumes fed at the right time. In April and May he pastured rye and toward the latter part of May allowed his cows to eat some sweet clover. In June he pastured the native grasses which were making good growth at the time. During the hot months of July, August, and September he pastured his fields of Sudan grass and gradually worked the cows back to a sweet clover diet late in September. Sweet clover was pastured through October. He fed a 13 per cent grain mixture, and reached his top milk production in July, one of the hottest periods of the year. Wachter had stretched a normal pasture period of three to four months to a full seven months.

Farmers in Missouri have been making rapid advances in developing all year pastures. Huston Holland, who farms in Saline County, Missouri, has 30 acres of pasture on which he feeds 30 head of horses and cattle the year 'round. "If a farmer doesn't have some good permanent pasture," says Holland, "he hits rough times during the bad years."

His pasture fields were originally rolling, upland timber. After the trees were removed the native pasture was bluegrass, but it eventually wore thin and Holland plowed the fields and planted corn for two years. He harvested 95 bushels of corn to the acre, and followed the corn crops with a mixture of orchard grass, timothy, lespedeza, and oats as a nurse crop. That was seven years ago.

"I also have a regular rotation which includes small grains," Holland says, "and I pasture the grain. Then, because I'm sold on ladino clover, I have five acres of solid ladino. My permanent pasture, small grains, and ladino clover give me a year 'round pasture program. The grain and ladino extend the grazing season into late fall, winter and early spring." Holland has limed this land once during the seven years of pasture production and in addition he applies phosphate twice every five years. Bluegrass will eventually take his fields over again, and Holland will disc them and reseed.

Holland's plan is only slightly different than the one which pasture experts in Missouri feel brings year 'round pasture within reach of every farmer in their state. With their new plan they figure they can now practically double the length of their pasture season, and triple the amount of feed which old style pastures provided. The building blocks for this newly designed pasture program are correct combinations of pasture plants, proper grazing of each crop, and fertilization.

What can be done in Missouri should also be possible in other Midwest states with similar climate. Northern Missouri is as far north as Indianapolis.

Until recently Missouri farmers had been content to rely on pastures primarily

(Continued on page 114)

AT EASE

When the maples take on their first faint touch of red and yellow and the call of the south-flying goose is heard at dusk high in the heavens, Mother Nature says, "At Ease."

And a welcome word it is to the farmer who has seen the sun rise and set in his fields since early spring. Now he can snatch a few more winks of sleep and dally over his second cup of coffee. For the granaries and the root cellar are full and the last sow has farrowed her fall litter.

The amber air, heavy and laden with morphia, lulls one into untroubled drowsiness. A sweet sadness fills the heart of man and beast. Harsh natures mellow. Mother-in-laws grow amiable; the Jersey bull becomes as docile as Elsie his wife; cats sleep in the sun and cease their prowling for birds; wicked men are kind to little children.

Children that were Spring imps turn into angels, out of sight all day long sliding down the new straw stack or sitting idly in the sun, dreaming the long dreams of youth.

Autumn brings delights for the inner man. Scrapple and corn meal mush fried in bacon fat and golden pumpkin pies come in with the first frost; and the best apples are the windfalls that hide under the leaves and grass beneath the orchard bough.

When the hogs are fed and the milking done a man can take his dog and his gun and strike off across the corn fields after the cock pheasant that has flaunted his bright plumage around the farm all summer. He can go fishing, or talk a spell with a neighbor across the line fence.

Autumn is the time for the outdoors—not too hot, not too cold—just right. There are those who prefer it to all other seasons, and not without cause. The poet says there is no day as perfect as a day in June—but the poet must have penned that line in June; not on a golden October day we know about.

THE RUSTLE of the Autumn leaves beneath his feet is sweet music to the hunter, and the sight of a good bird dog working the thickets and corn fields is just reward for a Spring and Summer of toil and sweat. Autumn is a man's season, for then he tastes the primitive thrill of the hunter, the larder and the grain bins are full against the coming winter, and his mind is at ease.

All summer the wildfowl have lived in the undisturbed solitude of the northland; they have courted and made their nests and hatched their noisy broods. Now as summer wanes they feel a restlessness, a primitive urge to be on the move. From the lakes and backwaters of Canada their long columns rise and on tireless wings they cover half a continent in a few days to find a summer home among the swamps and rice fields of the south.

GEORGE TAYLOR AMONG THE ENEMY in a moment of truce in the century-long battle between the Taylor clan and the rocks. Stone walls once formed a tight grid over the whole farm. When modern machinery came, many had to be torn down to make bigger fields. Disposing of them has been a headache.

Century Farm

BY GEORGE D. TAYLOR

The Taylor Farm was cited by Governor Dewey as a Century Farm. No outside money has gone into this rocky hill-farm which has grown from one hundred to five hundred fertile acres and supported six generations of the family in comfort.

AS Governor Dewey read the citation that listed the Taylor Farm among the Century Farms of New York, there was the implication of individual accomplishment. But I know that Century Farms are not made in any one lifetime.

I remembered the story of my great grandfather plodding along beside his oxcart two hundred miles into the wilderness: and, baffled by that very wilderness, selecting this meagre land site.

I recalled that eighty years later I had seen my grandfather start out in the morning with his black mare and buggy to make a round of neighborly calls, reminding me as he went to do my chores. And I remembered his stalwart sons, my father and my uncles, carrying his casket to the grave on the day of his burial.

I remembered the tremendous vitality and determination of my father: and his practical philosophy and his sacrificial generosity.

There came a picture of 1895—the grasshopper year. I was seven years old. The meadows and pastures were as bare and brown as the road. The only green things the grasshoppers hadn't eaten were the leaves on the trees: so we cut down the trees where

A PICTURE FROM THE FAMILY ALBUM shows Grandfather Taylor, the son of the first owner, and his eleven children and grandchildren posing stiffly on the homestead lawn.

THE PRESENT OPERATORS and future owners, the Henry Daytons, prepare a seedbed for cauliflower, one of the main cash crops. The Daytons operate the farm on a lease with an iron-clad option to buy. She is a fifth generation Taylor.

MANURE MAKES MORE GRASS to feed the cows and start the cycle again. Well over a hundred milk cows provide a regular milk check and enough manure to spread at the rate of six tons to the acre each year. Every fifth year the cauliflower land gets two tons of commercial fertilizer in addition.

both the cows and the hoppers could reach the leaves and let them fight it out.

So many cows were on the market for slaughter that five dollars was the current price for a medium fat one. One day my father had sold a cow to the butcher. I was leading her along the road to the slaughter house when I met a neighbor. Disposed to condolence, he said, "Well, I suppose you'll get five dollars for that one." and I promptly answered: "No, only four." Driving close enough behind to overhear it, my father was badly humiliated at having his poor bargain publicized. He often told the story later, either to illustrate the proverb "children and fools tell the truth," or more likely to point up the desperation of those days. The butcher would pay a hundred dollars for that same cow today.

In moments of vaingloriousness I read an element of idealism into the farm's history: but on sober thought it appears that stubbornness and the lack of initiative have been more dominant. The steady, plodding development of a rocky hill farm in north-eastern New York is a sordid thing. In fact, the recital of the farm's history will not be much more than a commentary on the operation of marginal land.

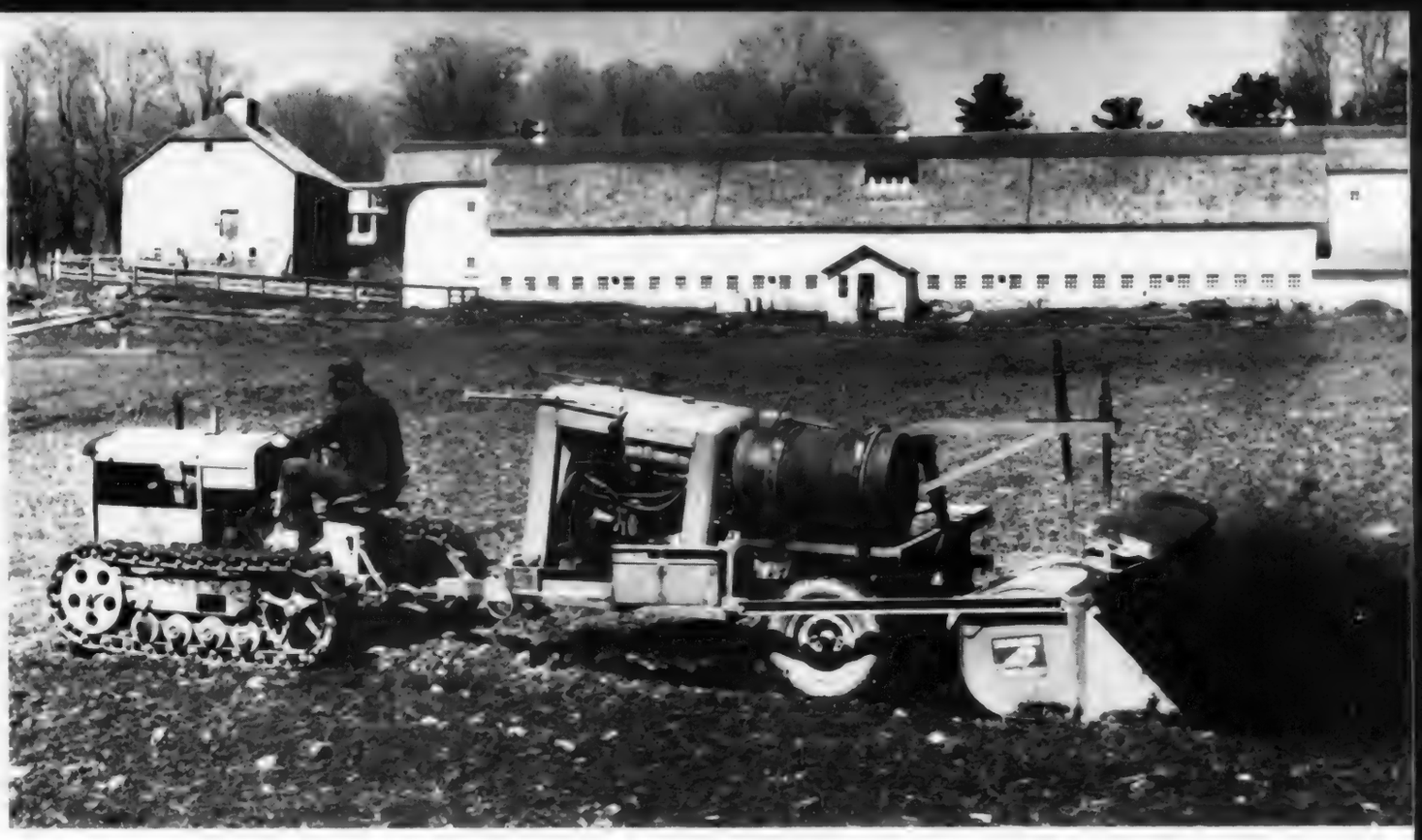
In the year 1800 that famous historian and traveler, The Reverend Timothy Dwight, then president of Yale, made a trip through New York state. After crossing the more settled areas on the eastern frontier, which contain the lands drained and leveled by the Hudson river and its tributaries, he crossed the mountains toward central New York.

"From Schoharie we entered Blenheim, ascending a mountainous acclivity near three miles in length." he wrote later. "This township, so far as it was visible from the road, we found an almost absolute forest, as we afterward did those of Jefferson and Stamford. I can scarcely conceive that an agreeable residence will ever be found in either of these places."

Into this very rockbound, rugged wilderness, 14 years later, came my great grandfather, a young widower, bringing from Barkhamstead, Connecticut, in his oxcart, two children and his possessions.

His destination was very near the western border of Schoharie county, in the newly established township of Jefferson, and close to the little settlement in Delaware county which later became known as Stamford. A less desirable piece of land than that upon which he lighted could not have been found in either of the two counties—a rocky hilly tract, interspersed with swamps and ravines, almost totally unavailable for cultivation, and containing not more than one hundred acres.

A living is always to be made by those who are smart enough to make a wise selection of opportunity. My great grandfather was not smart. He did not make a wise selection. But having got into it, he determined, not only to make the best



NEW TILLAGE METHODS are used to fight the rocks. Henry Dayton, who once piloted a B-24, drives a rotary tiller over the rocky soil. Occasionally tines are broken, but individual clutches permit the different sets of tines to slip and pass over big stones. With the hood up, the rocks fall on the surface; with it down, they are buried.

of it, but to make it produce what he wanted. This stoical doctrine has been the crux of the thing for all of us through four more generations.

The Stone Age

Though there was the primary task of timber and stump clearing, the chief obstacles to physical progress here have always been rocks and stones. In fact the whole history of The Taylor Farm is a story of rocks and stones—big rocks, medium rocks, loose rocks, fast rocks, shelly rocks, and boulders, and stones, stones, stones; stones on top of the ground, stones in the top soil, stones in the sub-soil. It is a story of crowbars, splitting wedges and sledges, of gunpowder and dynamite, and of chains, and oxen and horses and tractors, and of stoneboats and sleds and loose bottom wagons, of dump wagons and dump trucks. But most of all, it is a story of abdominal muscles!

Every physical contact with the land for any purpose has always been immediately and inescapably involved with a rock or a stone. In later years, I have often smiled as I watched the men lift and strain getting the big rocks out of the way, when I heard them grumble: "Why in hell did they ever take this land away from the Indians?" But then, as I turned away, I overheard them say: "His grandfather must have been crazy" and the terrible mistake of the whole thing sobered me. Timothy Dwight had been right in the first place. But it was too late to change: we Taylors have always got so far in that we couldn't afford to back out.

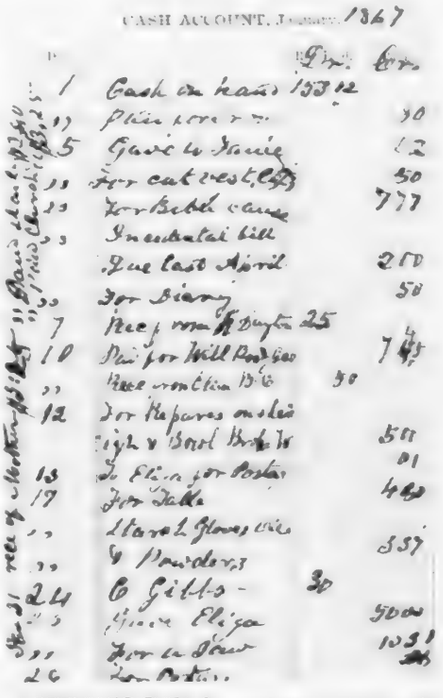
My great grandfather's first undertakings were to clear up small fields of three to six acres. Since fences were needed for boundaries and for the control of stock, it was a smart idea to use the stones in making walls, thus killing two birds, literally, with one stone. A slow laborious process, with oxen and stoneboats and crowbars, this fencing plan was finally almost fully carried out until, as I first remember it a little more than fifty years ago, the farm was a multitude of small walled enclosures. Though the land area had not then grown beyond one half a square mile, there were about 28 lineal miles of stone wall enclosing more than sixty small fields. For nearly one hundred years—three full generations, off season lulls had provided no leisure. There was always a new field to clear, and a new stone wall to build.

Little realized at the time, this accomplishment turned out to be no more than a beginning. In fact it was a forerunner of tragedy for, before we got through with it, the walls had to be moved again to make way for modern tools.

Making a Living

Somehow, in spite of this terrific early resistance, and perhaps, because he insisted on a superior standard of living for his family, my great grandfather managed to build up a farm economy of almost complete self sufficiency. The implements of good living could not then be bought on the installment plan, not even real money could have brought them into this remote place. They had to be produced; so he produced them in great array.

There was flax and wool for housekeeping and for clothes. There were hides tanned for shoes. There were wheat and



A PENNY TO ELIZA for postage, or two cents for Fanie, were faithfully recorded in the cash book by Grandfather Taylor in 1867.

THE STATELY HOMESTEAD, trimmed of its Victorian gingerbread, stands as a monument to the first Taylor who bought the farm and built this house.

THE UNWELCOME HARVEST of rocks, a truck-load from a ten acre field, still continues after one hundred and thirty years of cultivation and stone removal. This is one crop that never runs out on the steep Taylor hills.

rye and buckwheat to be ground into flour for bread and cakes. There was pork and veal and mutton and beef to eat. There were vegetables galore, in season and stored for winter. There were apples in great quantity, and pears and crabapples and plums, and berries of all kinds. There was wood for fuel stored in ample supply a year ahead. There were logs for lumber to build what was needed. There was tallow for candles, and grease and ashes for soap. There was maple sugar and molasses for eating and cooking. There was milk and cream and butter from the cows. And there was apple juice—I suspect it was strictly for vinegar—and clear cold water from the well to drink.

Outside, there was hay and grain for the horses and the sheep and the cattle. There was corn and buckwheat for the hens, and some extra for the mice and rats. And, most useful of all, there was always manure to mix with the stones to insure the growth of next year's crops, and thus complete the cycle of production.

Near the end of his active career, and as his culminating achievement, my great grandfather built himself a house. Without major external change or enlargement, it has now become old in the service of his progeny. After his manner, its lines are simple and modest: but it has proved sturdy, and it still stands upright.

My grandfather's advent into the proprietorship of the farm was almost precluded by a boyish encounter with our traditional enemy. A stone, which he had cast at a straying cow, hit a rock and glanced backward, striking and seriously wounding his leg just below the knee. Infection set in after a little and, in the judgment of a council of doctors, amputation was ordered to save his life. The next day the doctors came again with their tools and their bandages. My great grandfather was in the far field across the brook digging rocks. The horn was blown as a signal for him to come in.

What he thought about on the way home is not recorded, but when he came in the house he said to the doctors, "Take your tools and go home. I'll not have a crippled boy." Miraculously, or perhaps by providential intervention, my grandfather got well. He spent his life, with a slight limp, on two good legs.

The Taylors won that battle with the rocks, and sometimes I think my great grandfather's decision that day, on the way to the house, was prompted by his unwillingness to admit defeat at the hands of a rock. Concievably my grandfather's recovery was God's way of saying He would see us through if we kept up the fight. But as I look ahead at the still unconquered rocks here, it seems that He'll have a pretty long view of it.

My grandfather's province was not much more than the turning of a new furrow into the channel left by the preceding one. Though the raw edges of primitive life were disappearing, self-sufficiency was still the key note. The

period of his active life—between 1840 and 1880—was the lull before the stormy confusion of new things which began to deluge the country at the turn of the century. During his life there was almost no farm machinery. There was no telephone. There was no plumbing, nor even running water. Transportation for people and things was horse drawn, and restricted by narrow mud roads in summer and snow drifts in winter.

Little money was involved in the farm operation or in family maintenance. My grandfather's yearly accounts were methodically kept in a little space on the back pages of his diary. In 1871, the entire gross income was $867.23. And a cash balance of $142.63 was carried over at the end of the year, after a conscientious discharge of current debt. This for a family of eleven persons. They did not spend much, but they were well provided for. As each of the nine children went from home, to college, to business and to marriage, a substantial sum was provided to give substance to their venture. My grandfather's family was always his chief concern and his best crop.

To my father, the youngest of the lot, fell the opportunity, or the obligation, to continue the farm enterprise. During his career, with the tremendous growth of urban demands and with the development of deeper penetrating local railroad transportation, the possibilities of commercial farming became evident. For The Taylor Farm, as for many others in this area, New York City's demand for fluid milk has become the dominant factor in the farm economy. With the beginning of dairy farming, and the advent of the monthly milk check, the era of self sufficiency vanished almost overnight.

For more than 50 years we have been

(Continued on page 106)

THE OLDEST TAYLOR plays the melodeon and sings hymns with her great-grandchildren. They represent the third and the sixth generations of Taylors to occupy the farm. Still active at ninety, Mrs. Taylor still cooks and keeps a sharp eye on the farm.

Milking parlors and stanchions both have their champions,

but opinion is changing.

BY GEORGE LAYCOCK

DOES A PARLOR PAY?

MAN, who first made a slave of the cow, has in turn become the willing servant of his slave. In return for milk, butter, cheese, ice-cream, and a long list of other milk products, the dairyman does all in his power to make the cow comfortable. He has searched through his history books and worked overtime in his barnyard to learn what it is that makes a cow contented, for he knows that the happy cow does the best job.

Behind this constant revamping of our dairy cow accommodations is the steady demand for more and cleaner milk. Dairymen and health authorities agree that the day will soon come when it will be unlawful to sell other than grade "A" milk in any of our larger cities. And since few people disagree with the logic behind this campaign, research men and farmers are concentrating on how it can be done. As one Midwestern dairy specialist said recently, "The chain of sanitation practices must be as strong in one link as in the other. The farm milk plant is as important as the city plant. A farmer just can't produce clean milk when he goes to the barn in the morning and works over a gutter filled with manure. The cows have been there all night to make a mess and the farmer hasn't been there to clean it up."

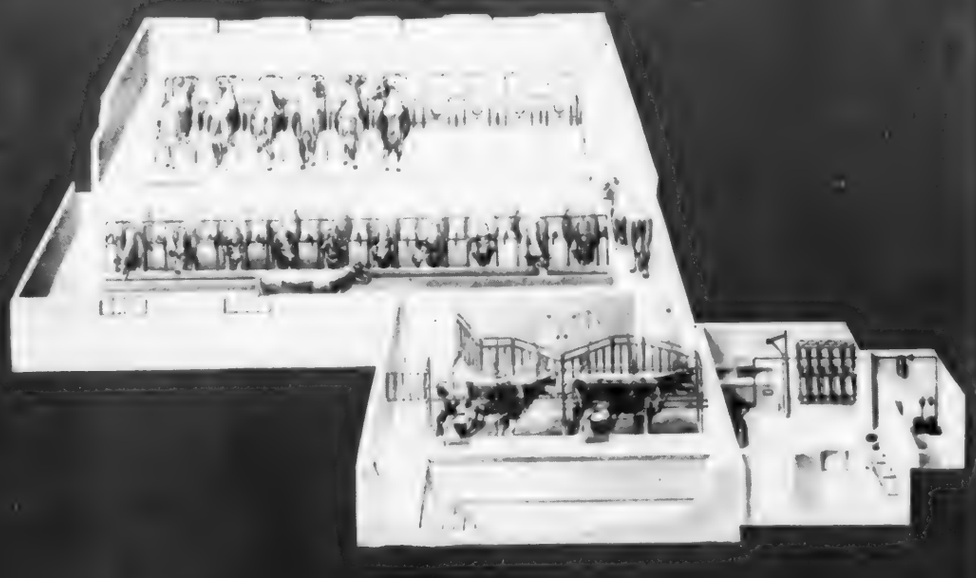
One solution which many dairy farmers are eyeing with increasing friendliness is the combination of milking parlor and loafing barn. For some farmers this is a fine solution, while others can't convince themselves that they would be benefitted by a milking parlor.

The use of loafing barns for dairy herds can be traced back to 1910. In that year dairymen at the Maryland Experiment Station were plagued with an outbreak of TB in their herds. In the search for a control measure they hit on the loafing barn idea. Why not, they asked themselves, keep the cows comfortable in well-bedded roomy areas between milkings? They reported that the idea helped to control the TB, but nothing much came of the findings. Then in 1914 Penn State tried loafing barns to see how they affected milk production and again found the plan promising. These

THE MILKING PARLOR is no longer a rarity and a neighborhood curiosity. Dairymen in every state are using them, building them, or planning to build them. The nearly completed parlor on the opposite page had three stalls and one man can handle the milking. The fine holsteins (above) will probably never be milked in a parlor because Al Roth thinks buyers get a better impression from stanchioned cows.

Milking parlors can be used with or without loafing sheds.

THE MILKING PARLOR and the loafing barn are generally team mates, but some farmers keep their cows in stanchions during the day and milk them in parlors. Most dairymen would consider this too much trouble. The loafing shed (top) is divided by electric fence to separate milked and unmilked cows.



experiments were followed by similar ones in Minnesota and at the same time a few widely scattered farmers were hearing of the plan and starting to use it.

One of the first milking parlors in the world was built at Denver, Colorado, in 1920 on the Brookridge Farms until recently operated by Ned Grant.

The idea spread rapidly during the second world war when farm labor was limited and milk prices were high. Farmers had to produce adequate milk with little labor. They found milk parlors a partial answer and many of them grew fond of the idea.

Wisconsin, where milk is a major crop, has long advocated housing dairy cattle in loafing sheds. Several years ago dairy research men at the University of Wisconsin recalled that the Carnation herd, one of the most famous in the country, is housed in loafing sheds. Wisconsin started some long range experiments to determine the value of loose housing as compared with stanchion arrangements, and within a few years was giving its full endorsement to loafing sheds. Edwin E. Heizer, Chairman of the Wisconsin Department of Dairy Husbandry sums up his institution's sentiments with, "We do not hesitate to recommend the loafing barn to any farmer who appreciates the importance of sanitary procedures."

Not all states come out with such straight-forward endorsements. Some discourage the idea, and some just tolerate it. Dairy specialists in Minnesota say that economic arguments favor loose housing and most farmers can't afford the present high prices of barns for stanchion arrangements. M. J. Regan, Extension Dairyman, at the University of Missouri, says, "We recommend a milking parlor and the loafing barn as being just as efficient and less costly than the large stanchion type of barn." Nebraska points out that the decision is pretty much a matter of the farmer's preference. The State of Washington also asks the farmer to make up his own mind. Milk companies in Delaware are discouraging the loose housing plan, since they feel that it is not sanitary. But Wisconsin experiments have found no significant difference in bacterial count. And so it goes with opinions fluctuating from one extreme to the other, but the overall trend is toward loose housing which apparently gains popularity as farmers and dairy specialists learn more about it.

There are several reasons behind this trend toward a change in our method of handling milk cows. Among the advantages of milking parlors and loafing sheds are: (1) they save labor, (2) they offer better sanitation when properly handled, (3) the farmer can milk without stooping and the comfortable milker does a better job, (4) the milk is not exposed to silage odors or hay dust, (5) the milk gets a minimum exposure to air, especially when the milk is piped into the cooling room,

MARBLE FLOORS and walls are the nice, but non-essential feature of this milking parlor. If he were building it again, this farmer says the stall floors would be a full 30 inches high to eliminate stooping.

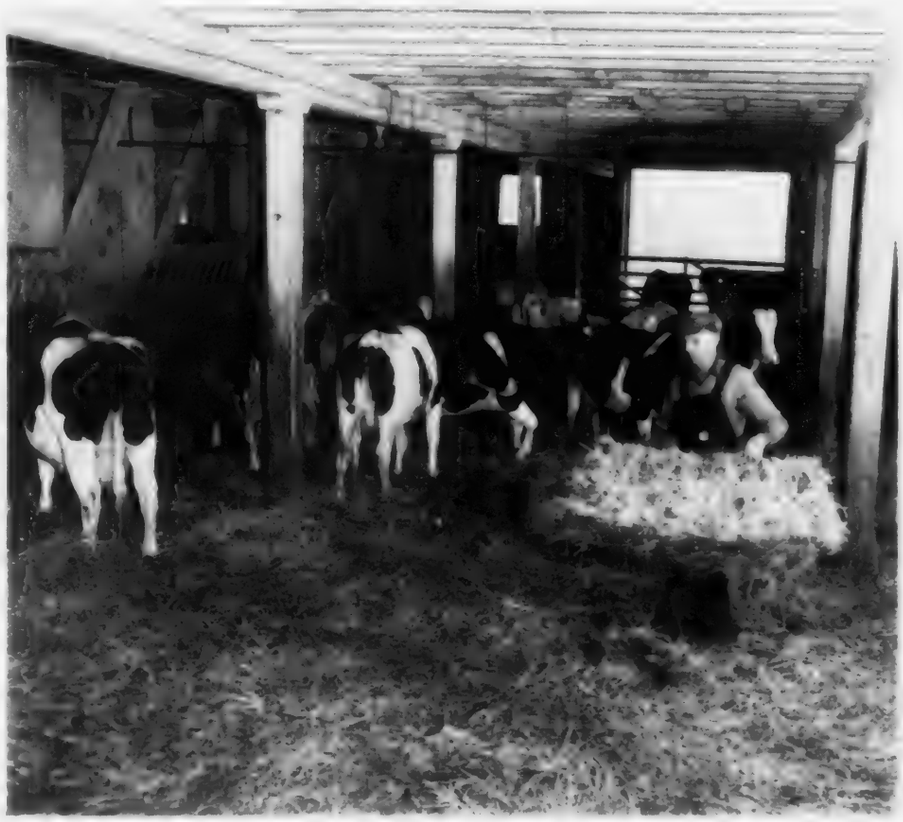
(6) the farmer can build milking parlors and loafing sheds cheaper than he can install stanchions because of the smaller area he equips with stalls.

Farmers from coast to coast are eyeing this list of advantages with increasing interest. Jock Davis, who milks 35 head at Sterling Massachusetts, changed to a milking parlor in 1947, and as a result has had less disease and few losses. "And because my rate of replacements is lower" he says, "I can select the best of my heifer calves and let the rest go for veal." There was some getting used to the idea at first and a few neighboring farmers considered it a passing whim. A year later, however, Davis said, "This is the first year we've felt like dairymen."

Authorities on the subject tell us that milking parlors first came to this country from New Zealand. Originally the milking parlor was nothing more than a room set aside for milking. Gradually parlors and the thinking about them evolved until today the average farmer considers a milking parlor a room equipped with cow stalls elevated to rule out the stooping and bending, and designed to save time and labor at every turn. Today the milking parlor is usually near, or attached to, the loafing area and it may include from two to 15 elevated steel milking stalls automatically operated.

Do Inspectors Like Parlors?

One factor which has held the milking parlors down in some localities is the attitude of milk inspectors about loafing barns. Milk inspectors, like farmers, sometimes warm up to the idea slowly. The first milking parlor-loafing barn arrangement in their territory may not make them happy. A survey in Wisconsin, however, showed that the more milking parlors there



COWS SEEM HAPPY in loafing sheds, happier perhaps than the farmer who hauls the straw. Fresh straw should be spread each day to help keep cows clean. Some farmers remove droppings daily, but a manure pack still builds up and provides heat for cattle during winter. Manure is removed twice a year with a loader.

are in an inspector's territory, the better he liked them. Once they have seen the milking parlors advantages they approve the plan rapidly.

The farmer who plans to install a milking parlor and loafing shed would do well to get the ideas of local health authorities. By consulting with the inspector before building he might save himself both grief and money.

Not every dairy farmer should have a milking parlor. Some of them can operate more economically with their already established stanchion barns. The dairyman who contemplates a change to loose housing should study the plan carefully. If he changes he should change completely and have no regrets. Loose housing is entirely different from stanchions for cows and the farmer making the switch should understand what he is getting into.

The farmers who are especially interested in the loose housing system are those who plan to remodel their barns, young farmers who want to go into the dairy business but have no suitable buildings, or farmers who must replace burned or unsafe barns.

The size of the herd has an important bearing on the final decision. The larger the herd the smaller the initial investment per cow in a milking parlor.

The research people usually say that farmers with more than 10 cows can afford milking parlors, but this rule cannot apply to every farm. In addition, the farmer must decide whether or not he plans to milk more cows, how much he has available, and how much bedding he can get for a loafing shed.

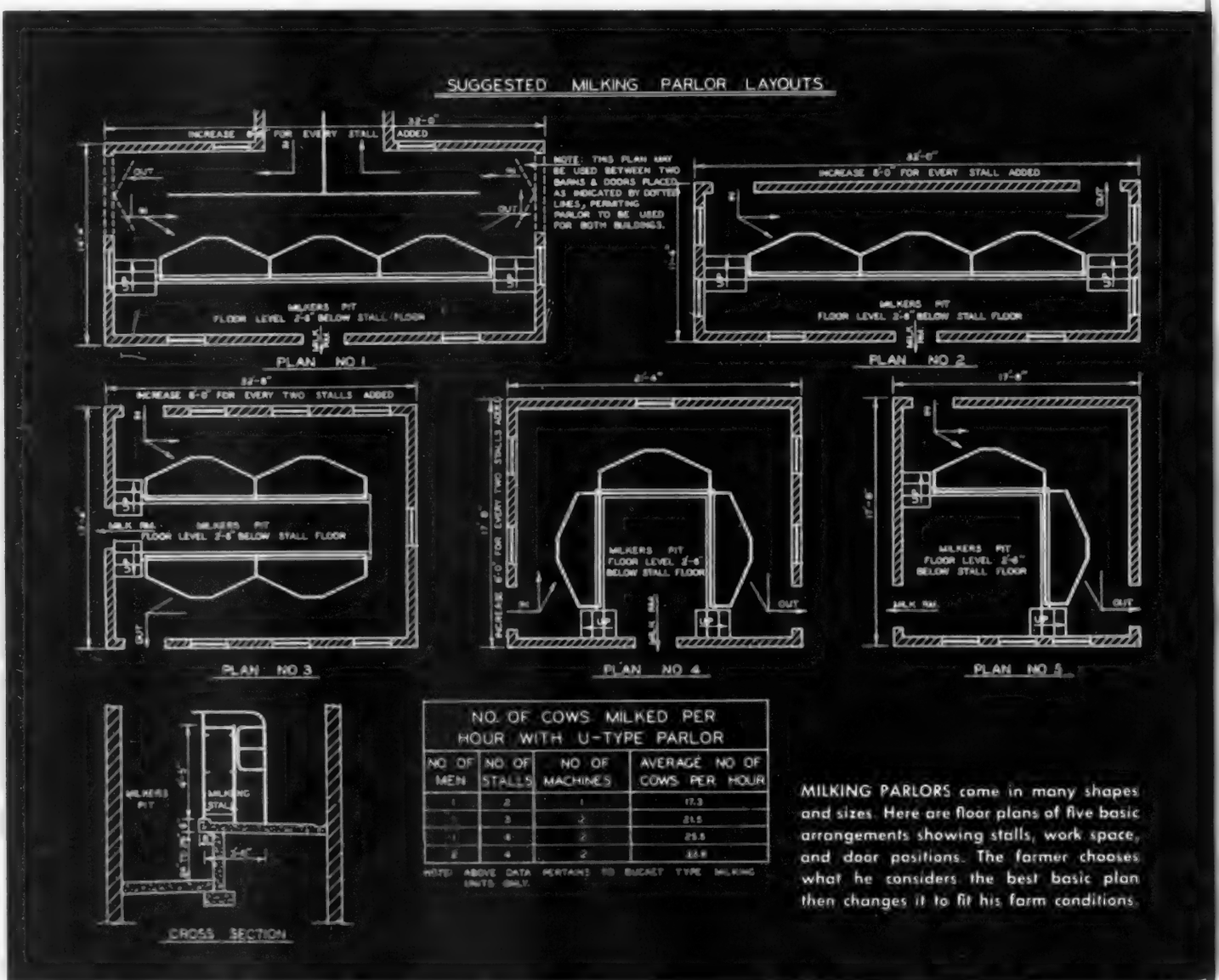
It is often unwise to build a milking parlor on a tenant operated farm. One tenant may like it and the next may despise it, and whether or not a milking parlor should be installed should be decided by the person who will work in it.

Since the farmer is interested in correlating his building plans with his bankroll he will be interested in the cost of building a milking parlor. One midwest survey revealed that a new milking parlor-loafing shed setup could be built at a cost of about $200 dollars per cow. The same survey found that by remodeling existing buildings farmers are cutting this cost in half. The cost of a new loafing shed and milking parlor for a 10 cow herd proved to be about $2000.00 The cost of a new stanchion barn for 10 cows may range from $3000. to $5000.

Only the farmer who has an abundance of inexpensive bedding available should choose loose housing, for a loafing shed requires three to four times as much bedding as do stanchions. This fact has ruled the loose housing idea out in some localities where there is a straw shortage.

In Connecticut, for instance, where bedding sells for about $27 a ton, extension men can find few farmers interested in loose housing. Where sawmills are operating nearby, farmers have successfully substituted sawdust for straw.

The loose housing system calls for five separate areas including (1) the milk parlor, (2) bedding area, (3) feeding area, (4) paved yard for loafing, and (5) pens for young stock.



MILKING PARLORS come in many shapes and sizes. Here are floor plans of five basic arrangements showing stalls, work space, and door positions. The farmer chooses what he considers the best basic plan then changes it to fit his farm conditions.

Courtesy Clay Equipment Corporation

BOTH STANCHIONS AND PARLORS present sanitation problems. Good management in either case is the key to clean milk. Inspectors in many areas still prefer stanchions to loafing sheds, but Wisconsin experiments found little difference in bacterial count of milk from either plan.

The milking parlor is the most expensive part of the plan, and the one which requires the most careful planning. Here the chores are done and careful planning can help insure easy work and clean milk.

The location chosen for the milking parlor should be carefully selected. The new, or rebuilt structure should be designed to fit the farm layout. Build the milking parlor as far as possible from the hog pens, chicken houses, and horse stables. There should be no fly breeding places close by. Good drainage, free movement of air, and unobstructed sunlight will help keep the milk plant clean. Dust is another evil that should be avoided when possible. It is a wise plan to pave the road leading to the parlor and milk house, and if possible the area immediately surrounding the milk house. If pavement is out of the question the area can be treated to keep dust down. If the parlor can be built on a slope the different levels of the parlor can be constructed with less concrete.

The ramp leading to the milking parlor should never slope more than 15 per cent because of danger to the cows. A small step at the top and bottom can reduce the degree of the slope. The ramp should have a rough surface to make it easier for cows to walk over.

The three basic floor plans for arrangement of stalls in the milking parlor are the tandem, the U-type stall arrangement, and the square or circular arrangement. The tandem arrangement calls for building the stalls in one row end to end. One man can usually operate three of these stalls. The best place for this arrangement is with large herds on farms where two or more men are available for the milking.

The "U" type arrangement is better where one man must manage three or four stalls. The efficiency of this plan drops considerably, when a second man is added to the team, because of the constant crossing and duplicating of steps during milking.

Probably the least common arrangement is the square or circular plan where the milker is surrounded by cows. The work area is compact and every stall can be easily reached in only a few steps. This arrangement is not practical where the milk must be carried from the parlor to the milk house. In the releaser type milking system, however, where the milk can be piped to the coolers this is the most efficient type parlor a farmer can build.

One of the most common milking parlor arrangements is two stalls, one on either side of a central working space. Any sized herd that justifies a milking parlor is large enough to support one with two stalls. The cows stand in stalls 30 inches above the floor of the working space. The man who manipulates the milking machine can keep two cows going through until the chore is finished. By pulling a rope he opens a door in front of the milked cow and lets her out into one side of the loafing shed. By pulling another rope he opens the back door and the cow next in line comes in for her turn at the milking machine.

There are several variations of these arrangements and the one chosen depends on the size of the herd, the building arrangement, the whims of the herdsman and the type of milking equipment being used. Generally speaking, there should be one stall for every five or six cows to keep the twice daily milking period from consuming too much of the working day. Some farmers keep a cow in the milking parlor four minutes or less, but since most farmers feed concentrates in the parlor the time allowance may go up. Generally, cows will eat about one pound of grain a minute, and as much as 12 minutes should be allowed for feeding, milking, and releasing a cow. This makes it possible to milk five cows an hour in one stall. An efficient farmer can often increase this to seven or eight cows an hour. By figuring the total size of his herd and the amount of chore time he is willing to use for milking twice a day he can easily determine the number of stalls his milking parlor should have. One variation is to build the stalls along two adjoining walls of the milking parlor at 90 degree angles to each other. A long narrow parlor can have four or five stalls in a row and the cows walk through all of them to get out. The equipment dealer is usually prepared, and of course willing, to help farmers plan their new milking

(Continued on page 139)

MILKING PARLORS must be kept clean, but need not be fancy. This home-made parlor was designed by a professional farm manager and tenant Otis Keffaber (above) helped construct it. It has four stalls, two along each of opposite walls. Feed is measured and dropped before the cow conveniently. Doors are opened and closed by ropes. The milk room is only a few steps from the parlor to save chore time.

BY RUDOLPH SEIDEN

PASTURE for POULTRY

Pasture and silage are reducing poultry feed bills

FEW poultry farms have a silo, but poultrymen are beginning to feed grass silage to their birds and many have been practicing a good pasture program for years. Green feed will never replace grain as the main feed for poultry—chickens just aren't equipped to handle as much bulk as ruminants—but grasses and legumes have an important place in the poultry diet.

Andreus Jacobson, a Norwegian poultryman who migrated to Utah and took over a 10,000 hen farm at the foot of Mt. Timpanogus where the pasture season is relatively short, said in his precise English, "As in Norway, green feed I give to the chicks and pullets to give them good body and strength. To the laying hens I feed chopped alfalfa in the mash; during molt, I put laying hens on pasture to gather for themselves green feed. We feed this way in Norway to conserve our precious grain and the chickens seemed much healthier than when not fed green feed."

GRASS SILAGE FOR POULTRY can be the same feed that was ensiled for cattle; made for poultry alone, it should be chopped finer. It is fed at the rate of two to five pounds a day for each 100 birds.

New findings of poultry scientists confirm Jacobson's practical beliefs and their recommendations would carry the feeding of green stuff even further than his practices.

Whittling the Feed Bill

During the past fifteen years the heavy emphasis on grass farming has stimulated research on the feeding of grasses and much new knowledge has been accumulated regarding the economic and nutritional importance of grass. Particularly important findings have been made regarding the diet of chickens and turkeys. Savings in the cost of poultry feed amounting to 10 to 20 and even 25 per cent have been reported from all parts of the country where green feed was used as a supplement in the diet. In addition to the savings effected by substituting an inexpensive feed for grain, there are indirect savings that are not always noticed. Birds that have the proper amount of good green feed in their diet are not only consuming digestible proteins and vital minerals, but are also getting practically all the vitamins they need.

The well balanced diet of pasture fed chickens pays off in heavier more vigorous birds. Controlled experiments made at the University of Tennessee over a period of three years showed that at the age of from 4 to 20 weeks pasture-raised pullets were as heavy or heavier than those raised on bare ranges, and from that age on the difference grew more marked in favor of the pasture-raised birds. At 28 weeks, the pullets on alfalfa averaged 0.3 pound heavier than those raised on bare range; at 32 weeks the alfalfa fed pullets had a full half pound advantage. Pullets on ryegrass-lespedeza or spring oats ranges gained approximately half as much advantage over the bare range birds as the alfalfa fed pullets.

Mortality figures for a three year period averaged 9.5 per cent for the pullets on pasture as compared with 13 per cent for birds raised on a bare range. The alfalfa pasture again proved to be the most economical, averaging 6.4 per cent mortality—one year it fell to 3.6 per cent—while on the bare ranges the mortality never fell below 7.3 per cent. An even more significant test for the practical poultryman was culling. Of the pullets alive at four weeks of age on bare ranges, 29.9 per cent were culled at 32 weeks of age, while of those raised on alfalfa pasture, only 5.8 per cent had to be culled. In other words, 94.2 per cent of the pasture raised pullets made the grade and went on into the laying houses.

Increasing the Income

Here again the result of the better diet was apparent. In experiments conducted at the Kansas State College, it was proved that the average number of eggs laid by hens raised on different types of pastures ranged from 185.2 to 189.7 for a 50 week laying period as against 163.2 for hens kept in bare yards. The income, above feed costs, was 26 to 30 per cent higher from the pasture-raised hens than from the bare lot birds.

With an all-this-and-heaven-too touch,

by as much as twenty per cent.

the scientists add that green feed helps prevent cannibalism and feather pulling.

Pasture is the cheapest source of all feeds, requires the least labor, and is the surest way to get the maximum amout of feed value into the bird before it is bleached by sun, leached by the rain, and desiccated by the air. Some poultrymen who haven't the available land for pastures feel that fresh green feed is so valuable that they haul lawn clippings and other waste greens such as kale, cabbage, and pea vines to their confined birds. Such fresh green feed should be fed at the rate of four to seven pounds per day for each 100 birds in addition to the alfalfa meal or other dried greens in the mash. Where the flock is on full pasture, alfalfa meal can be omitted from the dry or wet mash mixture. Mash, however, as well as grain should be fed to growing pullets and to layers kept on pasture. In order to force the growing birds to consume a maximum amount of green feed, mash, grain, and grit should be put into the hoppers on the range only in the afternoons or on alternate days.

Whenever the weather makes it possible, three or four day old chicks should be allowed out of doors onto young pasture or pasture that has been clipped. They will get the benefits of direct sunshine and will form the habit of eating green feed which should last them through their growing and laying periods.

At least six vitamins that are essential for poultry growth and health occur in varying amounts in all green feeds. The amount of vitamins will depend on the type of feed, its stage of growth, and

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HENS IN CLOVER get all the vitamins they need from the legumes, grasses and sunshine. If they feed too heavily on green stuff it will darken the yolks of their eggs; the darker yolks have more food value, but bring lower prices.

LEGUMES NEED HELP

Legumes without proper bacteria, like a tractor without fuel, won't work. Inoculation is inexpensive crop insurance.

ROOT NODULES are the legume power house supplying nitrogen for the growing plant. Nodules should be large, numerous, and pinkish in color. The microscope shows they are packed with one-celled bacteria.

BACTERIA, like people, have a wide range of habits. Some bacteria specialize in causing milk to sour, potatoes to rot, or hay to digest in the stomach of a cow. Still other bacteria spend their time taking free nitrogen from the air and turning it into nitrogen fertilizer which plants can use. These bacteria work within the nodules on the roots of legumes. They do their work so well that they constantly prove themselves friends of the farmer, and the farmer in turn tries his best to make the friendly bacteria at home in his legume fields.

The bacteria responsible for this soil enriching movement are those that live in cohabitation with legumes in such a manner that both the bacteria and the legumes reap benefits. Scientists call this a symbiotic relationship, and farmers call it a darn clever trick on the part of Mother Nature. One of every five acres under cultivation in the United States is planted to some legume, and with proper handling these legumes are soil builders. Scientists have computed that an acre of properly inoculated alfalfa adds from 50 to 100 pounds of nitrogen to an acre of soil each year, equivalent to the nitrogen in a ton of commercial fertilizer.

A carton or can of inoculant usually contains only two things: (1) the bacteria which the farmer needs for his legume and (2) a filler material for the bacteria to live in. The filler is usually humus. The bacteria in an inoculant are breeding stock of the required strains. They are ready to go to work in the soil, multiply and start forming nodules on the legume roots. These bacteria have no effect on the myriads of other bacteria that live in the soil. An inoculant does not inoculate anything; it is the bacteria themselves. They are harmless to man and beast and seem only to be concerned with their appointed duty of turning nitrogen into fertilizer.

The good work of the legume is nothing new to the world's farmers. Although they hadn't doped out the reason behind the phenomena, the ancients of Greece and Rome knew that legumes enriched the soil. They even knew that by carting a few loads of soil from an old legume planting to a new seeding they could get a better legume crop.

It was not until 1886 that the biology behind this time-tested practice was exposed. In that year two German scientists, Hellriegal and Wilfarth, demonstrated that the ability of legumes to make nitrogen was tied up with the peculiar little nodules on the roots. Previously the nodules had been considered nothing more than unusual little bumps with no known purpose. These two scientists also pointed out that the legume bacteria were drawing their extra nitrogen from the air.

Once the scientist had put his finger on this relationship things started popping, for here was a finding with great practical application. The air presents an endless

source of nitrogen, and here with the aid of legumes was a method of getting the nitrogen into the soil where it could help, not only the legumes, but also the following crops. Nitrogen is the element of which life is formed in both plants and animals, for nitrogen is the raw material of wnich proteins are made.

New research in the nitrogen fixing properties of legumes has been going ahead each year. Today a corps of scientists in various parts of the country is working to solve the many still unanswered questions about legumes, and their inoculation with the proper bacteria. Some of the most active research in this field is being done at Madison, Wisconsin, by the College of Agriculture. Agricultural scientists at Wisconsin are trying to discover among other things, why some legumes have no nodules, how bacteria fix nitrogen, and what are the proper bacteria for the inoculation of each of some half a hundred commonly grown legumes.

Legume research is slow, plodding, and unspectacular. Wisconsin scientists have been digging out answers to the puzzling questions for several decades and like all scientists, are content to piece the answers together a little at a time.

The University of Wisconsin, in the early days of artificial inoculation, grew and sold legume cultures commercially. Then commercial legume inoculant companies started doing an increasingly good job, and Wisconsin decided to limit its activities to research.

With all these years of research we still have no definite information on just how this nitrogen fixing process works. The scientists admit that they just don't know how the bacteria turn atmospheric nitrogen into fertilizer. Farmers, however, are content to accept the fact that it does work and not worry to much about how.

The legumes make up a large plant family; there are more than 10,000 species of them. Only about 50, however, are cultivated in the United States. Not all legumes have nitrogen fixing nodules on their roots; only 887 have been found which have that important ability.

The Free Nitrogen

The legumes of the world will never experience a shortage of raw materials in their manufacture of fixed nitrogen, since about 80 per cent of the air is free nitrogen. This adds up to 35,000 tons over every acre of land. But in the atmospheric form the nitrogen is totally useless to plants or animals. The legumes and their bacteria are the middlemen which can turn this nitrogen into forms than can be used, but it is no easy task. Nitrogen is contrary about entering into compounds with other elements. Forcing it into combinations requires tremendous power such as a charge of lightning or a chemical charge resulting from very high heat. A bolt of lightning often changes atmospheric nitrogen into a form which plants can use. A farmer can't make lightning, but he is fortunate in having legumes which can do this important job and do it nicely with little fuss.

Scientists have known for a long time that there are different kinds of legume bacteria. The bacteria that team up with alfalfa will not work with peas. If lima beans are inoculated with the bacteria intended for sweet clover the bacteria will not help the beans and, because the beans require nitrogen to live, they draw on supplies of soil nitrogen. And for the same reason soybeans, blue lupine, hairy vetch, white clover and all the other legumes we grow require special, carefully selected bacteria if they are to be properly inoculated. When research men realize that legume bacteria were selective they organized legumes into what they called "cross inoculation groups." Each group of legumes can be inoculated by a specific culture of bacteria which is usually a combination of several strains of bacteria. There are seven of these legume groups at present, each containing several legumes which can be treated with the same bacterial culture. Separate commercial cultures of inoculant are prepared for the following groups of plants: the alfalfa and clover group, soybean group, pea and vetch group, cowpea group, bean group, lupine group, and what is called a "specific strain group." In the latter are those plants which require their own exclusive bacteria. Birdsfoot and big trefoil, black locust, and crown vetch are among them. This combining of legumes into inoculant groups simplified the farmers' job of choosing the proper bacteria for each seed mixture, as well as the manufacturers' job of selling the cultures.

Recent research at Wisconsin has reaffirmed the need for selecting specific bacteria for certain legumes. Under the

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THIS LUSH LEGUME GROWTH has an underground team-mate in the friendly bacteria mixed with the seed before planting. The 75 pounds of nitrogen, which inoculated legumes can add to an acre of soil, is equal to the nitrogen in seven and a half tons of manure or 2,500 pounds of 3-12-12. The inoculant costs about 20 cents.

How to make BUTTER

FIRST you get a cow. Then you extract the milk from the cow, extract the cream from the milk, and spank the daylights out of the cream with a contrivance called a churn. Result, if you are lucky, is butter. If your skill is equal to your luck you will have good butter.

This all sounds very simple, but few people can make good butter. Unless you know the tricks you may not be able to make butter at all, even if you have all the equipment—and the cream. In some ways, butter making is an art, an art which is lost today on most farms. Contrary to a belief among some city people, notably brides, butter does not come in quarter-pound sticks direct from the cow. Formerly all the butter was made on the farms where the milk was produced. Now most farmers sell their milk and cream, and butter is made in factories commonly called creameries. With few exceptions, farmers' wives have gone out of the business. They prefer to sell their cream and take the money to the grocery and buy their butter tailor-made. In 1924 more than 175,000,000 pounds of butter were made on American farms; in 1949 this had dropped to 41,500,000 pounds.

Those who have been introduced to butter made by a true artist never again will be satisfied with the pale, tasteless product which is ordinarily sold over the grocery counter. There is no gift of Mother Nature's so nearly like the Ambrosia of the Gods as really fine butter.

MRS. IRA KEATING, of Mauch Chunk, Pa., used to make 40 lbs. of butter a week in her dasher churn; she now makes five. Farm butter making has fallen off in late years. The creameries produce a more uniform product, but creamery butter can't beat the home made article such as an expert like Mrs. Keating turns out.

Butter Making In Simple Steps

Anybody can buy a brush and a can of paint, but not everybody can paint a good picture. You may have a cow and all the tools of butter making and still not be able to turn out good butter because there are many intangibles in butter making. You have a "feel" for doing the right thing at the right time. This takes experience and an inborn knack.

Mrs. Ira Keeting, a farm wife who lives near Mauch Chunk, Pa., has the knack. She is known far and wide for her fine butter and has taken prizes at fairs. She claims there is no secret to butter making, but like all artists, she finds it difficult to pass her skill along to others.

To make good butter, Mrs. Keeting says, you will need a cow, a churn, a wooden butter ladle, a wooden bowl, a wire mesh strainer and a dairy thermometer. The thermometer is important. Many oldtime butter makers do not use a thermometer. Mrs. Keeting depends on a sixth sense or her thumb to tell her when the temperature is just right. The novice, however, cannot assume that she has the gift of guessing temperatures, so she had better go to the drugstore and buy a cheap thermometer. Much of the success in butter making depends on the proper temperatures.

Use cream from fresh, clean flavored milk. If your cow has recently visited a wild onion patch, you might as well feed the milk to the hogs. Nobody wants onion flavored butter.

There are two ways of getting the cream out of the milk. The oldfashioned way is to set the milk in cool water for 24 hours and then skim off the cream. The oldfashioned milk house was made for this purpose. Water from a cool spring was

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SORGHUM: silage or grain

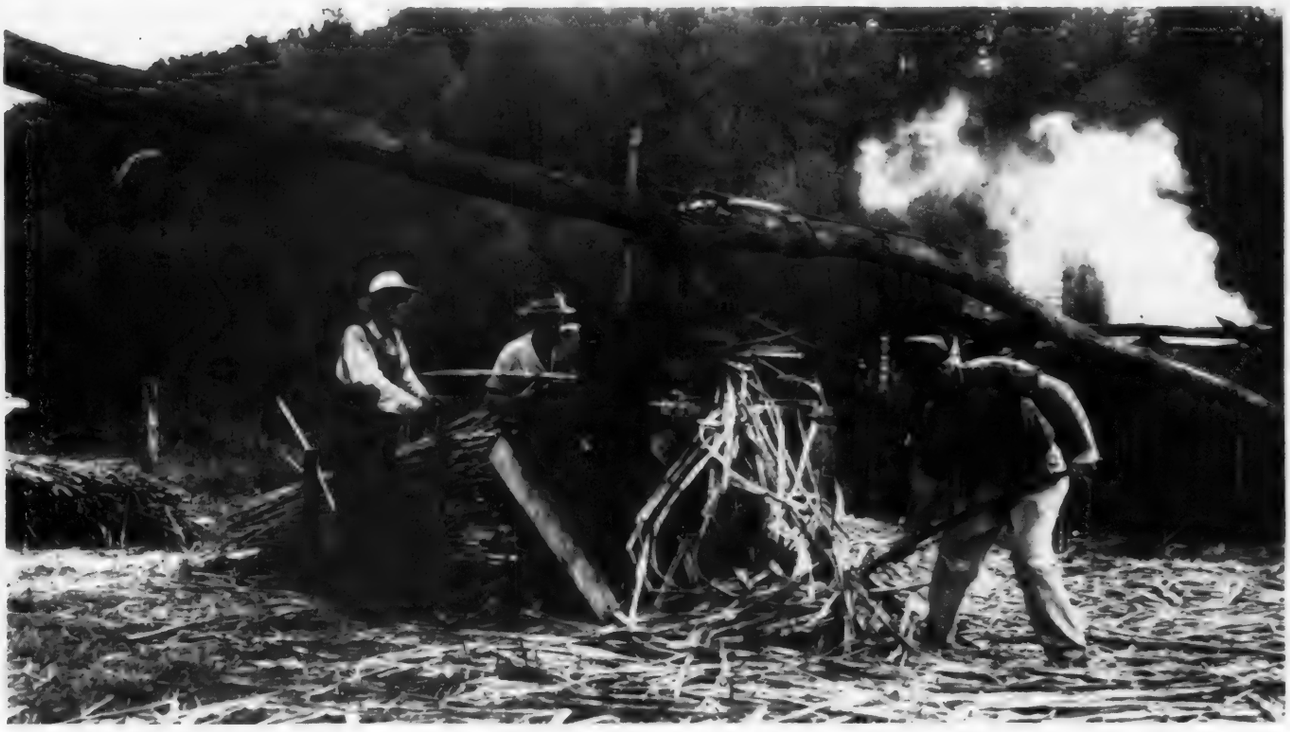
SORGO FOR SILAGE is cut with a forage harvester. The new varieties of grain sorghum can be harvested with a combine. Such mechanization has lowered labor requirements for the crop by 900 per cent and kept sorghum competitive with corn.

SORGHUM has been called the camel of the plant world because of its ability to withstand hot, dry weather that would kill corn. It might better be called the 'possum of the vegetable kingdom because its resistance to drought comes from its ability to play dead during the dry spell and later revive and go on growing. When other crops are dying of thirst, sorghum curls up its leaves, stops growing, and waits in its dormant stage until the first rain comes, then it starts growing again.

The peculiar ability of this exotic grass to withstand dryness stems from the fact that it has a great many more secondary roots than corn, which it resembles, while its leaves are narrower and have a waxy bloom. The abundant roots make it an efficient water gatherer while its narrow, waxy leaves let less of the water escape in the form of evaporation.

Because sorghum can be a moderate and drink water or leave it alone, it has become an important grain and forage crop in those areas where corn cannot be grown or does poorly because of drought. Over

Once an important sirup crop, sorghum is now grown for grain, forage, and for silage. It can sleep through a corn-killing drought and revive with rain.



JUICE FROM THE CANE is ground out in a one horse powered mill. Steam from the evaporator rises in the background. Once synonymous with sirup, only one per cent of the crop is now grown for juice.

BY GRANT CANNON

90 per cent of the crop is grown in seven states, Texas, Kansas, Oklahoma, Colorado, Nebraska, New Mexico, and South Dakota, in those sections of the states where heat and the lack of moisture make corn growing a poor risk. The success of the livestock business in this area is dependent on the 15 million acres of sorghum that is grown for grain and also for forage each year. For, though the young plants contain enough prussic acid in their stocks and leaves to make them dangerous to cattle, much of the crop is fed as forage when maturity has made it a safe feed.

In general, sorghum is thought of as falling into two classes: grain producing sorghum and sweet sorghum, usually called sorgo. Broomcorn, Sudan grass and Johnson grass are also sorghums and can be crossed with the grain sorghums and the sorgos, but, because of their specialized uses, they are generally considered as separate crops.

When the combines started rolling over the wheat country, sorghum raising, with all the manual labor that went with it, became almost too great a burden. The development of knee-high combine varieties, however, has reduced the labor requirements of the crop by around 900 per cent. What the combine did for the grain crop, the forage harvester is doing for the production of sorgo silage. With present day machinery, both crops can be completely mechanized.

Sorghum is believed to have originated in Africa in the dark ages of that dark continent. It spread from there through Europe, the near east, India and China, and finally to America. Its travels covered many centuries. "A carving on the walls of King Sennacherib's palace in Nineveh, Assyria, built about 700 B. C. showed a field of mature grain sorghum in which could be seen several hogs that perhaps had strayed away from his neighbor's wallow," says John H. Martin, one of America's leading authorities on this plant. "A mosaic found in 1916 in the ruins of an 1,800-year-old palace in Timgad, North Africa," he continues "shows a man reclining on a couch grasping a large head of grain sorghum that would take first prize at any county fair today."

The first sorghum seeds are believed to have been brought to this country by slave ships from Africa. The two slave-introduced varieties were called Guinea kafir and chicken corn. Chicken corn has gone back to the wild and grows as a weed in many southern states. The first sorgo was introduced in 1853 and four years later Horace Greeley arranged for the importation of 16 other varieties. Though Greeley urged young men to go west, sorgo he sent south where the Zulu names of the 16 varieties, Oomseeana, Vimbischuapa and the like, were changed to such American names as Honey, Sumac and White African. The major purpose of these importations was to establish a sorghum sugar industry in this country, a project that has continued to receive attention up to as late as the last war. The sugar extraction scheme was never put on a practical basis, but sorgo sirup has been a companion to buckwheat cakes in many

parts of the country and, during times of great need, sorghum grain has been eaten by the people.

Sorghum products are standard features of the diet in many parts of Africa and Asia. The sorgos are peeled and chewed for their sweet juice and the grain is ground and used in mush and breads or popped like corn. In America the Department of Agriculture has issued recipes for using the sorghum grain in mush, pancakes, bread, cookies, waffles, muffins, doughnuts and puddings, but American women have refrained from using it by the millions. Here the crop is strictly an animal feed except for that one per cent of the sorgo crop (which is) used for sirup production.

Grain Sorghum

The heart of the grain sorghum area is northwestern Texas, Oklahoma, and southwestern Kansas. In eastern New Mexico and Colorado, southern Nebraska and South Dakota, and in the irrigated lands of Arizona and California the crop is also grown. On the unirrigated parts of this region corn is a risky crop giving an average yield of around 14.5 bushels to the acre, and some years failing entirely. Sorghums, on the other hand, produce well where they can get as much as 17 inches of rain. The average yield of sorghum grain is 16 bushels to the acre. Sorghum can be grown outside this dry area in any part of the country where the frost free growing period is long enough to give it from 80 to 140 days to mature the grain, but in these areas where corn does well, sorghum cannot compete. The greater moisture will help raise the yield of sorghum, but it will raise the yield of corn even more. Not only will sorghum yield less than corn in corn country, its grain is worth about five per cent less as feed, and its price on the open market will usually be lower than corn. The govern-

TALL SORGO AND SHORT SORGHUM are the two extremes that have been developed. The Sorgo (above), which is grown for silage, is thirteen feet tall and hasn't headed out yet; the double dwarf grain sorghum (below) is short enough for harvesting with a combine. Sorgo yields more silage per acre than corn; sorghum yields less grain than corn; neither feed is as nutritious as corn.

CULTIVATING THE CROP (top) is the same tedious process used for corn. When grown for forage (center) the crop is cut and left in the shock to cure until winter. The mature heads on the sorgo (bottom) show it is ready for silage; if cut too soon, the crop has less food value, more prussic acid, and may spoil.

THE OLD FASHIONED WAY of harvesting (left) was to cut the heads from tall grain sorghum in the field and leave the stalk for stover. Occasionally sorgo is planted for hay (below) by seeding with a drill or broadcast. Curing is a long process.

ment support price for last year's crop reflects this general difference in price. In Rush County, Kansas, where both crops are grown the support price for corn was $1.38 a bushel for number three grade or better and $1.14 a bushel for number two grade or better sorghum grain (the actual price was given as $2.15 for 100 pounds or sorghum grain since this is the customary lot for pricing; number two grain must weigh 53 pounds per bushel).

Like other grains on the market, sorghum has its official standards set up by the U.S.D.A. Five general classes have been designed for sorghum based on the color of the grain: white, yellow, red, brown, and mixed. Within each class the grain is graded numerically into four grades plus a sample grade according to its weight per bushel, moisture content, and damaged kernels and foreign material present. As with most other grain, prices are usually quoted for number two grade, but with sorghum the price quoted is for 100 pound lots instead of by the bushel.

Most sorghum is fed on the farm where it is raised as is its big competitor corn. The sorghum grain is fed at about the same rate as corn, but here it becomes even more important that a good legume hay supplement be fed with it as it lacks some of the vitamins contained in corn. A fattening ration for two-year-old steers would contain 18 pounds of head chop (the ground grain and the head on which it was grown—comparable to crushed corn and cob) with nine pounds of alfalfa hay. Reducing the ration two pounds for each of the ingredients, makes a suitable amount for yearlings. More of the grain, which is smaller than wheat and hard, will pass through the animal undigested than will corn, which makes it worth while to grind the head chop and makes it even more economical to have pigs follow cattle when feeding the whole grains.

With sheep, which chew their food well, and with chickens the whole unground grain is fed as a substitute for corn. In feeding pigs the head chop is used in a self feeder with tankage in a separate compartment. Where pasture or good quality hay is available, a brood sow should eat a pound and a half a day of head chops to each one-third pound of tankage. Skim milk or buttermilk if it is plentiful may be used to replace the tankage. Where the hogs are on good pasture the ration should be twice as much milk by weight as grain for brood sows and hogs under 150 pounds and equal amounts of milk and grain for hogs over 150 pounds.

There are several families of sorghum which differ from each other in the juiciness of their stalks, the tallness of the plant and its leafiness, and such growing characteristics as its tendency to tiller. Some of these major families are: kafir, milo, feterita, durra, and hegari. The

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HOW TO BUY A HEIFER

The purchase of bred heifers is often the answer to herd replacement or herd building. A better plan for the long haul is a good breeding program.

"Good cows are like good girls; they stay close to home," says John Watlington, whose southern Kentucky dairy produces milk for Nashville, Tennessee. "Those that find their way to the market have some good, or rather bad, reason for being there. Some are shy breeders, some are kickers, some are extremely low test cows, some milk well for three or four months and then quit, and some are chronic mastitis cases."

Other farmers have found that Watlington is right. Good cows can be bought at dispersal sales where all the animals, good or bad, are sold and occasionally a good cow will be sold on the open market, but most dairymen, logically enough, sell their culls and keep their best cows for their own use. Even at a dispersal sale it is well to know the seller for he is bound to tip off his best animals to his friends.

GOOD COWS live on good farms. A herd can be judged by fences, pastures, barns.

Fred McClain, of Xenia, Ohio, has been increasing the size of his herd in recent months and has run into the problem of buying good cows on the open market. "We bought a good milker a short time back—that big, black one over there—that the dealer said was free of mastitis, easy to breed, and milked 90 pounds. Naturally we didn't expect quite 90 pounds just because he said so," McClain said, "and she didn't; but she did give over 60 pounds and that is all right. The catch is that she kicks. She's got both accuracy and force in her kicking. Why, she could knock the buttons off of your shirt without tearing the cloth. Now we know why she was sold. It's so easy to fool a buyer, and so tempting. You see that Guernsey, over there? She's a registered animal, she's a good milker, has no blemishes, and she's gentle. I could probably get a good price for her right now. The vet that examined her and I are the only ones that know she has heart trouble and that she won't survive another calf. So, instead of selling her for a milker, I'll sell her for beef. But, if I were that kind of dealer, she would be a natural to palm off on an unsuspecting buyer."

The answer to the problem of how to buy replacement cattle that Watlington, McClain and other dairy farmers have worked out is to buy bred heifers. Some farmers, like Charles Koester, of Rinard, Illinois, will say, "Too risky. If I'm going to gamble I'd rather bet on race horses and get some fun out of it." But those who believe in buying bred heifers have some good arguments on their side.

It isn't like buying a cow, they argue, where you are buying an animal that someone else has tried and rejected. And, furthermore, you are buying an animal with all of its useful life ahead of it. The heifer won't have any bad milking or feeding habits and will be easy to train to your routine. One very important argument is that heifers won't be infected with mastitis or have had mastitis in the past. More calves will be raised from an animal when purchased as a heifer than when bought at third or fourth freshening. And finally, they say, a heifer can be purchased for less than a mature cow, though this price difference is narrowing.

"It's true that you don't know what a heifer will produce," says Fred McClain, "but then you can't be too sure with a mature cow About the only thing you can count on is getting some pretty tall tales. Some of the stories I've heard remind me of the man who bought a little Jersey. When he led her home he found that she was afraid to cross a bridge, so he just picked her up and carried her across. When they reached home, he milked her. And, you know, that little cow gave so much milk that he couldn't carry it back to the house all in one load! When you buy a heifer you are spared the fairy stories about her marvelous production. You have to depend on what you can see and find out about her."

The Dairy Conformation

In selecting the individual animal to be purchased, farmers try to get one with what is called a good dairy conformation. Though tests over a number of years have shown that the dairy conformation does not insure high milk production, it is generally agreed that poor conformation means poor production.

The conformation of the heifer is a pretty good indication of the conformation of the cow she will be when she matures. The heifer's immaturity shows up in the relationship of the different parts of the body to each other. Her legs will be longer in proportion to her body than a cow's, the body itself will be narrower and shallower, the mammary

A THIN TAIL AND FINE HIDE in a heifer are preferred by Lawrence Brown who likes his dairy animals rugged but elegantly put together. Brown buys and sells thousands of dairy animals each year; he prefers to deal in bred heifers.

glands will be much less developed, of course, and the heifer will carry a little more flesh for her bone structure than will a cow.

In general, the dairy look is little more than skin deep, since the skeletal structure of dairy and beef animals is practically identical. Generations of breeding have developed the tendency in dairy animals to turn feed into calves and milk while beef animals turn it into flesh. This thriftiness on the part of dairy cattle tends to make the bone structure appear more prominent, giving an angular look to the cows. Dairymen look for three wedges that are formed by this bony structure of the cows: (1) looked at from the side there will be a wedge with the apex in front of the head and its spreading sides extending, one down the back and the other under the belly and udder; (2) viewed from in front there will be a wedge with its wide part across the shoulders and its apex at the withers; (3) seen from above the third wedge is formed with its base across the hips and its apex at the withers. These wedges are not as prominent in the heifer as in the mature cow because of a little heavier fleshing, but they should be there nevertheless. A large chest, which is another desired dairy characteristic, gives greater capacity for the heart and lungs and is an indication of vigor. A deep, wide barrel is most desirable in order to give ample room for the processing of large quantities of feed. The chest and barrel should be framed in well sprung ribs—a two or three finger spread between the last ribs is desirable.

More detailed characteristics of the dairy type include the wide set of the legs, incurving thighs, the long thin neck, fine skin that is loose and pliable covered with hair that verges on the silky. More important than these fine points are the actual working parts of the critter, the barrel that indicates capacity, and the

CHECKING A HEIFER involves observing her udder to see if she has plenty of leather (left) and if the udder is well placed. The results of the TB test show on the under side of the tail (right): a positive reactor will have a noticeable bump there. Prodding with the fist (right) shows the size and location of the calf she carries: records show the date of freshening. The dairy head (below) is an indication, but no guarantee, of a future milker.

udder which is the cash producer.

The udder is, of course, undeveloped in a heifer, but some idea of its set and future size can be gained from examination. It should be well forward and have plenty of loose leather behind for future growth. It should also show symmetrical development and placement of the teats. Preliminary work by dairy scientists indicates that a great deal can be learned from the mammary development of heifers at four months of age. In their tests, the calves showing marked development at this early age averaged 4,000 pounds more milk as mature cows than calves with retarded development. Unfortunately, the technique of palpating the calves' udders and predicting the future of the animal as a milk producer is one, its discoverers insist, that can only be learned by demonstration. Another sad fact is that it was

found to be much more difficult to predict what the heifer could do by the time she reached two years than it was at four months. Judging the dairy heifer near the age of first calving, the dairyman must conclude that with the udder as with general conformation, good points may not insure heavy production, but defects that will hinder production can be detected.

Of less interest from the point of view of production, but still important when it comes to a matter of resale, is the likeness of the heifer to the standards of perfection set up by the different dairy breed associations. In buying heifers, Watlinger and McClain and other dairymen will try to secure animals that conform to the special characteristics of a particular breed.

Wholesale Buying

Many dairymen will buy replacement heifers from cattle dealers whom they can trust. The dealers, in turn, are constantly checking the dairy herds to find animals to be sold. One such dealer, Lawrence L. Brown, of Cincinnati, Ohio, heads a cattle buying concern, L. F. Brown and Company, that was established by his grandfather over a hundred years ago. During the year Brown's two sons, Lawrence Jr. and Richard, scour the country buying suitable dairy heifers for their clients. Though they buy and sell dairy animals of all ages, their trade in bred heifers has been steadily growing until today they are handling over 2,000 a year. Brown has established a reputation for

handling fine stock and regularly sells animals in all parts of the United States and in South America and Europe. There is nothing in his methods of selecting a heifer, however, that an ordinary farmer cannot use: his advantage—and it is an important one—lies in the fact that he can afford to send buyers far from the milk sheds of the big cities and employ spotters in these regions who locate the best animals for his buyers to see and bid on. Brown believes that his chances of finding good stock for sale are so much greater out of the milk shed area than in it, that he makes no effort to buy stock near any large town. His two sons, who act as buyers for the firm, are constantly traveling in search of good stock.

"We go to areas where the farmers are selling milk to cheese factories and condensaries," Lawrence Brown, Jr., says. "In those areas we usually find some farmers who have as many cows as they can conveniently handle and who consider their heifers as part of the cash crop from their dairying."

Typical of a Brown buying trip is one to western Michigan where the company has a business arrangement with a cattle spotter named John Nofzinger, a grey haired, retired farmer whose life-long enjoyment of gossip has kept him just nosey enough to know which farmers are thinking of selling bred heifers and how much they are likely to ask. Nofzinger was a dairyman himself before he retired and knows dairy cattle about as well as any man in his area. He keeps tab on freshening dates of heifers that are for sale and lines up a group of farmers for Larry Brown to visit when he comes through.

"The last time I was in Michigan," Brown says, "Nofzinger took me out to look over some heifers owned by another Dutch farmer, Ed Heizingah. I mention this because it is just about the type of place we look for everywhere. Heizingah's place has good fences and buildings and excellent pastures which are good indications that he has good animals. I knew from Nofzinger that he milked 10 cows and had four bred heifers, two that would be fresh within a couple of months and two that were bred later. He sold his milk to a condensary in Zeeland, Michigan, and didn't want to expand his herd

(Continued on page 132)

A GLIB TONGUE AND SHOWMANSHIP are always helpful in selling a herd, but you must deliver the goods to hold your customers. Brown insists there is no more gamble in buying a good heifer than there is in raising one.

Compost Goes Commercial

(Continued from page 38)

of phosphorus and two pounds of potassium. Organic fertilizer, however, is more effective than this rating indicates. If yields from two fields, one fertilized with an organic 4-8-4 and the other with an equivalent inorganic formula, were compared over a period of years, the organic plot would give higher yields because of the increase in humus. Organic matter, being subject only to small losses from leaching and oxidation, holds its nutrient until the plant needs it. Organic matter improves the texture of the soil, encourages the absorption of water, and tends through the action of acids produced by its bacteria, to unlock major and minor minerals present.

Trace minerals, whether already present in the soil, or added at so many pounds to the acre through chemicals are not usually soluble in water. They get to the plant through the action of bacteria, and it is this friendly bacteria that good compost has, and chemical fertilizer has not.

The farmer will want to give the organic fertilizer a trial run to determine its value on his land and for his crops. If his soils are low in humus, compost will increase yields more than if he is farming humus laden fields. But if soils are very low in nitrogen, phosphorus and potash compost alone cannot supply it unless applied in quantities often prohibitive for the average farmer.

Will Green Manure Serve

Compost is more valuable when it is not possible to grow a green manure crop; when manure, crop residues or other on-the-farm organic fertilizer is not available, or when a soil is packed hard and needs a conditioning to reduce erosion and moisture losses. It would not pay to buy an organic fertilizer if, for the same price, you could get equal fertilizer value plus erosion protection from a green manure crop.

Compost is extremely bulky in relation to the amount of actual fertilizer value it contains. It is a more or less living substance requiring a favorable environment to be effective. It is dried and pulverized, and can be applied with a drill. It should be covered. If exposed to the sun and air on the surface of the soil, its bacteria will not be able to perform efficiently their plant food producing function. Most soils under standard rotations need about five tons of compost every four years, and many farmers apply considerably more.

The best way to tell if a soil needs humus is to have it tested by a laboratory. To many farmers this is a lot like saying "the best way to tell if it's raining is to call the weather bureau," for a farmer can usually tell if his soil needs organic matter by merely feeling it. If his top soil is habitually hard to the touch, if his crops often suffer during dry spells, or if rain bounces off the land instead of soaking into it, he knows the field is short on humus.

Because compost does not lose its nutrient value rapidly, time of application is not too important. Choose a time in the rotation when the biggest growing boost is needed. Side dressing during the growing season is unnecessary. There is no need to worry about soluble salt injury or overdoses of fertilizer. Merely decide how much compost your plants need, apply it, and it will be there waiting to go to work. The control of soil activity with lime is important when organic fertilizer is used. Bacteria will not release plant food quickly unless the pH of the soil is favorable. However, where soil is too acid large quantities of compost will neutralize it.

Rigid fertilizer laws present an obstacle, but not an insurmountable one, to the organic fertilizer industry. In many states, converted garbage can be sold by advertising and selling it as compost and not as fertilizer. Other states require that a minimum guaranteed analysis accompany all fertilizer shipped within their borders. Since the chemical analysis of composted garbage varies according to the ingredients used in its manufacture, the results of each day's production will have to be analyzed and rated separately.

As yet, little experimentation with commercial compost has been done by the experiment stations. As more composted garbage becomes available, the results of field trials with it on all types of soils will be known. The organic fertilizer industry, is just getting started. Its ultimate success will hinge on the industry's ability to produce the fertilizer in large quantities at prices farmers can afford to pay for large scale use. Whether or not compost will ever replace chemical fertilizers is not a good question since each offers a different value; not necessarily a competing one. At present there is far too little compost produced to supply demands.

There are plans afoot to build and sell to farmers small farm sized compost digesters which can be economically used to turn farm produced manure into balanced humus. The movement is just getting underway as part of the general trend in putting organic wastes to work. When the plan reaches the practical stage for the farmer he will probably accept new fertilizers as readily as he has taken up new machinery and crop varieties.

THE AUTHOR: Robert Rodale, Managing Editor of *The Organic Farmer*, is the son of J. I. Rodale who has led the organic movement in this country. On their organic farm at Emmaus, Pennsylvania, they conduct a never-ending series of experiments to show American farmers the value of organic material in building soils and health.

"They ain't had nothin' to fight about since they both agreed the new BFG tractor tire pulls best!"

Farmers who have tried the leading makes of tractor tires agree that the new B. F. Goodrich Power-Curve tires give the most traction. And tests prove it! In hundreds of tests in different types of soil, the tires with Power-Curve cleats outpulled them all. These new tires have the proven open-center tread with cleats higher in the center then those of the other two leading makes. Cleats are hard-nosed—for quick penetration. The special curve of the cleat provides self-cleaning action, power to bite, power to pull. And the extra-high cleats mean extra-long wear. See the BFG retailer the next time you're in town. To get off to a good start with a new tractor, specify B. F. Goodrich tires.

An advertisement of The B. F. Goodrich Co., Akron, Ohio

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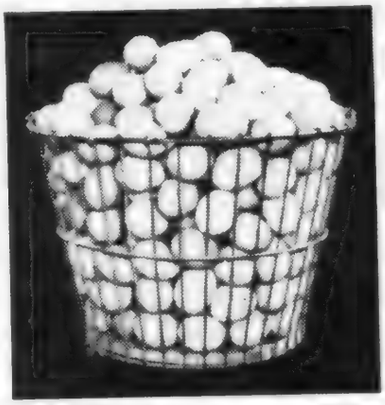
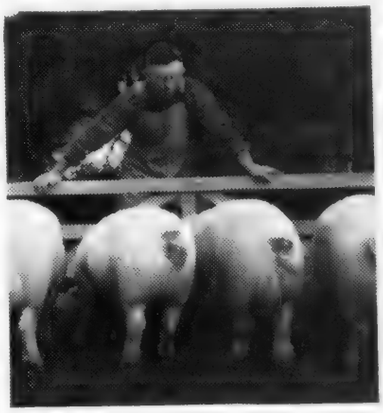
HIGH EFFICIENCY FEEDING

FARMERS EVERYWHERE enjoy hearing others describe their methods and results to Med Maxwell, ace farm interviewer, on the popular "Let's Go Visiting!" radio program. They hear actual on-the-farm reports from farmers getting "High Efficiency" results like these:



HIGH EGG PRODUCTION . . . They follow the proved Wayne "High Efficiency" Program to get *early eggs . . . steady laying . . . low production cost.* The Wayne Way helps them and thousands of other poultry people "Write Their Own Egg Check!"



SPEEDY MARKETING . . . They tell how Wayne "High Efficiency" feeding helps them get bigger, stronger litters of fast-gaining pigs. They get to *early* markets, thanks to a *quick* start and a profitable *fast* finish. "Makin' Bacon" comes easy the Wayne Way!

MORE MILK PER COW . . . They tell how they make cows pay, year in and year out, the Wayne Way. Fed and managed correctly from birth, their cows get *extra nutrition* for long lifetime production and *more milk per cow.*

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Your friendly Wayne Feed Dealer is "At Your Service" on Wayne Feeds and the Wayne Way to "High Efficiency" results with all of your poultry and livestock. The times demand *efficient* production for top profits . . . so find out now what *Wayne can do for you!*

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Back of Every Successful Livestock Enterprise Is a Sound Feeding Program

Successful Farmers Report Many Benefits of Feeding The Wayne Way

"We follow the *Wayne Way* all the way, and our records speak for themselves. We housed 246 New Hampshire Reds Aug. 27; 260 White Rocks Aug. 30, 552 White Leghorns Aug. 24, 1948. They produced 195, 217½, and 220 eggs per bird in 33-4 days!"

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"Our 20 Jerseys produced 6,788 lbs. milk and 395.9 lbs. butterfat on 2 times a day milking during 305 days in D.H.I.A. testing. One of these cows, Nancy Volunteeress 1.516,607 (see picture) produced 13,077 lbs. milk and 1,005.9 lbs. butterfat in 365 days, on 2 times a day milking. *Since we started our dairy herd 6 years ago, we have used Wayne exclusively to balance our home grains.*"

D. H. SHIVERDECKER, GREENVILLE, OHIO

"This year we are again raising a bunch of Holstein calves on *Wayne Calf Feeds, which have been an important part of our program for the past 10 years.* The picture shows part of our future dairy herd, and friends and neighbors who have seen these calves are now using Wayne Calf Feeds also."

BARNEY VAN HANDEL, APPLETON, WISCONSIN

"We have been on the *Wayne Program for the past 7 years. It has what it takes* for show-ring or fattening pens. Our first purple ribbon was won at the Lake Co. Fair in 1945. Since then we have won many ribbons at State & Co. Fairs. Picture shows our Grand Champion Berkshire Boar at the 1948 Indiana State Fair. Last year we had a Gold Medal litter, 9 pigs, 51 lb. average at 56 days.

R. E. ROSEBERRY & SON, HEBRON, INDIANA

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Allied Mills, Inc., Ft. Wayne 1, Indiana
Send free feeding information on:

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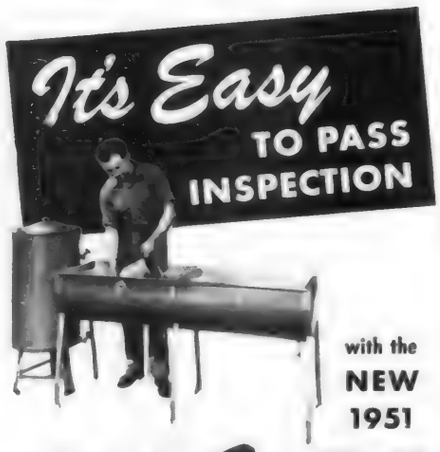

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ELECTRIC DAIRY WATER HEATER and STAINLESS STEEL WASH TANK!

Keeping things clean is no problem when your milk-house is equipped with these modern Safgard conveniences. Their high quality and rugged construction assure many extra years of dependable service. Here is equipment of which you will always be proud!

Only the SAFGARD Heater Gives You All These Advanced Features!

- FULLY-WELDED COPPER TANK—15 and 20 gallon models.
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All metal parts are made of copper, brass and rugged galvanized iron. 100% Fibreglas insulation. Attractive Hammerloid finish with red trim. Moderately priced.

THIS STAINLESS STEEL WASH TANK

is Guaranteed for Life Against Corrosion! Single or double units. T-Channel legs have bolt holes for easy addition of extra tank. Seam-welded seams for greater strength. Easy-to-clean Hammerloid finish. Moderately priced.

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Please send illustrated folder and prices on the SAFGARD Heater and Wash Tank.

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Address.....

City.....State.....

FARMING IN ENGLAND

(Continued from page 29)

would correspond to what we here in America call a "Sunday Farmer," owned a 74 acre farm in Kent. This was not a specialized farm. There was a dairy herd of 12 cows, about half the farm was in pasture and hay, and the remainder in grain. It was discovered by the county committee to have 15 laborers. The management was taken away from the owner and placed in the hands of the committee, which brought in a young fellow as its own tenant. He is permitted to have two laborers. The gardens around the manor house are not as well cared for as formerly, but the farm is making a contribution to the nation's food pile. The county committees are made up of representatives from the farmers' organizations, the farm workers' unions, the Central Land Owners Association, and those appointed by the Ministry.

Leases run from one to fifteen years, and the tenant has first option on renewal. With rare exceptions, rent is cash. The landlord owns the buildings, but all machinery and stock are owned by the tenant. The tenant signs a contract, binding him to rather rigid conditions of soil management, but such is the traditional permanency of a tenant that not even a war nor a near-economic collapse can budge him from his farm. He comes to regard it as his own and since he can look forward to passing the lease on to his son, he cares for it as his own. The average length of tenancy in Great Britain is 21 years, four years longer than the average length of ownership in the U. S.

During the lean postwar years when British landlords found their incomes reduced to the vanishing point, many wanted to work their own land. According to law an owner may terminate a lease (1) if he wishes to farm the land himself, (2) if the tenant can be shown to be a chronically poor husbandman. However, few landlords succeed in dispossessing their tenants because the owner must submit evidence to the County Committee that he could do a better job of farming than the tenant. Even when the land changes hands, the tenant retains first option on renewal of the lease, and can pass it on to his heirs under certain mild conditions.

PART II

The Mackies of Aberdeen

While farming in Great Britain is predominately on a small scale, there are large farms too. Maitland Mackie, of Aberdeen, owns and operates 1,100 acres, which would be regarded in Midwest America as a large operation.

What manner of farming and what manner of soil will regularly yield 75 bushels of wheat to the acre on land which has been farmed for 450 years; what is the secret of pasturing two cows per acre for seven months of the year; and is a socialist government hamstringing the big British farmer in favor of the small farmer?

These questions are answered in Scotland, one of the least favored parts of the United Kingdom, on the farm of Maitland Mackie. His father and brother add 1500 acres more to the family holdings. During the 450 years that the Mackies have been engaged in a ceaseless battle with the weather, the granite rocks which seem to grow and multiply in their fields, and the heather which creeps in the night across their pastures and their oat fields, they have learned a few tricks which could well be used here in America.

Home Life Of The Scotch Gentry

Maitland Mackie is Scotch from the roots up. He can turn on a burr which makes the so-called English language utterly Greek to a foreigner, or he can talk Peoria Americanese. He offers his guests four ounce drinks of the beverage which has made Scotland famous and eats oatmeal porridge with a dash of salt 365 days out of the year.

He has the air of a man whose family has enjoyed ample income for generations and knows how to get around in Paris, Amsterdam, or New York. On the other hand, he knows how the family accumulated the difficult shillings and pence. Thrift is a necessity of survival in Scotland.

He lives in a rambling manor house of granite. There is no central heating—but a fireplace in each room. There are bath tubs as large as suburban swimming pools, and featherbeds to sandwich the sleeper on the cold winter nights. He knows the rare luxury of servants who traditionally take pride in serving well. He pays a bonus to all his workmen, based on milk, egg and crop production.

He drives a V-Eight, sends three of his six children to boarding school, and is at home at the best clubs, where he meets his friends when he is in London or Edinburgh. He keeps a detailed record of all his farm operations and knows to a tuppence what each field and each pullet is doing. He has extra sets of tractor tires in his repair shop and an extra for every bolt on every machine on the place.

The socialist government has pared his take-home income to the bone, but he nevertheless expresses an honest conviction that its goal, a decent living for everyone in England, is worth sacrifices on his part. He is not a Laborite himself, but a Liberal, which is somewhere between Churchill's Conservatives and Bevin's socialists. "My politics," he says, "when I have time for such things, are somewhat the same as your Democrats."

As a farmer he is somewhat unique—show him a new idea and he is willing to try it—not tomorrow, but today. He works hard; in fact he sometimes misses afternoon tea.

Irrigation News

WEATHER: Make your own!

FROM ALUMINUM COMPANY OF AMERICA

VOL. 1 NO. 4 FRUIT EDITION • AUTUMN, 1950

Part of the Dillons' new orchard acreage, laid out on the contour.

Pumping irrigation water from one of the Dillons' ponds.

Dillons are Doubling Sprinkler-Irrigated Acreage, Trap Rain in 22 Ponds

Hancock, Maryland—With the technical assistance of the Soil Conservation Service, Sam Dillon Sr. and Sam Dillon Jr. will soon be equipped to sprinkler irrigate 600 acres of their peaches and apples. To provide a plentiful water supply, they've built or are building 22 ponds, ranging from small ones to a pond of about 10 million gallons capacity.

Reporting on their success with sprinkler irrigation, Sam Dillon Jr. writes: "We are using sprinklers and quick-coupling portable aluminum pipe for supplementary irrigation on 300 acres of apples and peaches in Western Maryland. Our normal rainfall is sufficient to produce ordinary crops of apples and peaches. But irrigation from small streams and ponds in our orchards ensures larger yields, better-sized fruit and good bloom buds.

Marketable Fruit Every Year

"In some years," says Dillon, "when rainfall is very short in the 30 days before peach harvest, irrigation will enable us to raise marketable fruit. In other years, when a good proportion of our rainfall comes in heavy thunder showers, we can retain much of the runoff water in ponds and put it back on the orchards with lightweight, portable equipment. There are very few years in our territory when supplementary irrigation won't pay big dividends. In the very dry years, it often means the difference between profit and loss. We like to think of the day when we may have the water supply and equipment to use it on all the 3000 acres which we have planted in apples and peaches."

The Dillons' irrigation system, equipped with Alcoa aluminum pipe, was designed by Sunset Engineering Co., Riverdale, N. J., and purchased through Lewis W. Barton, Haddonfield, N. J.

Moving Aluminum Laterals Is a One-Man Job

Handling and moving portable irrigation lines is a quick, easy job—thanks to the light weight of aluminum. For example, 4-inch Alcoa aluminum irrigation pipe weighs less than a pound per foot. That means one man can carry two or three 20-foot sections at a time, with ease. With quick-connecting couplings, it takes only a moment to join or disconnect pipe. Even though it weighs only one-third as much as steel, Alcoa pipe is exceedingly strong—hard to dent or nick.

LOCAL SOURCES OFFER HELPFUL IRRIGATION ADVICE

While the operation of a portable sprinkler system is not complicated, you'll get more profitable results if you start by getting sound advice. Your county agent or a reliable supplier of sprinkler equipment will help you plan the best system for your farm. If you do not know of a supplier nearby, write to us at the address on the coupon below, and we'll be glad to suggest firms you can contact.

Sprinklings

Nature made Alcoa aluminum irrigation pipe highly resistant to corrosion. Needs no paint.

* * *

In general, soil that will not hold together when pressed in the hand calls for irrigation.

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The marking "ALCOA 63S-T6" on irrigation pipe means it is made of a tough aluminum alloy, tempered to take rough treatment in the field.

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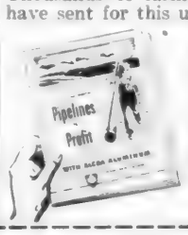
For overtree irrigation, sprinklers are mounted on aluminum risers as high as 20 feet.

Did You Get This Free Book?

Thousands of farmers all over the country have sent for this useful 32-page Alcoa book on portable sprinkler irrigation. Be sure to get *your* copy! It's full of information on equipment, costs, installation. Tells how farmers have used irrigation to improve crops, make more money. Mail the coupon today!



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A ½ oz. SAMPLE BOTTLE OF
NUTRI-PLANT
LIQUID FERTILIZER
• HIGHER YIELD PER ACRE
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• FASTER EMERGENCE
Pre-soak your grain with NUTRI-PLANT before planting. Simply dip seed or sprinkle, shovel over and allow to dry. No expensive equipment needed. Gives your crops that EXTRA needed vigor for greater yields.
Use NUTRI-PLANT on Wheat, Barley, Oats, Rye, Corn and smaller grains. With its controlled PH factor, NUTRI-PLANT enables seedling to gain earlier maturity.
NUTRI-PLANT increases your yield and adds profits to your present operation. Now is the time to buy NUTRI-PLANT for your Winter Wheat. See your dealer today.
Please send at once your FREE ½ oz. bottle of NUTRI-PLANT and folder, post paid.
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Cut Feeding costs up to 40%
If you feed Hogs, Cattle, Sheep or Poultry you need a BELL "Modern" Hammer-Mill to get the most profit out of farming.
GRIND YOUR OWN GRAIN & ROUGHAGES
Cut feeding costs and increase the weight of stock animals by feeding home-grown, GROUND shelled or ear corn, with or without shucks, oats, wheat, alfalfa, clover and soy bean hay. A BELL "Modern" Hammer-Mill will do it for as little as ¾ of a cent per hundred pounds. 1000 pounds of properly ground feed often produce as much Milk or Meat as 1250 lbs. of unground feed, thus the highest possible Feeding Value for growing pigs, and other stock animals is obtained at the lowest cost per pound of increased weight.
SAVE MONEY ON GRINDING COSTS!
BELL HAMMER MILLS are made for ELECTRIC or ENGINE POWER, in 2 Universal, Low Cost Sizes. Capacities up to a ton of shelled corn thru a ¼" screen, or 1400 lbs. of ear corn thru a ⅜" screen, per hour. Write today for full information.
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Send for Special Illustrated Folder and Prices today.
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CORN SHELLERS HAMMER-MILLS FEED MIXERS

The Durable Scot

Scotland is a rock-ribbed land, where for many months of the year the sun is obscured, the cold mists whip in from the North Sea, and the sheep and cattle huddle in the folds. This rugged land has produced a rugged race. Resourceful, thrifty, and proud, they have wrested an ample economy from the granite slopes of their hills and probably, man for man, made more of an impact on Western civilization than any other people.

Although the climate of Scotland is tempered by the Gulf Stream, its winters are long and its summer nights often cold. The diversification of crops which makes more favored countries prosperous is denied to the Scotch by the climate and the soil. But they have adapted their livestock and their crops to the rigors of the climate, the hardier grains, rye, oats, and wheat, and tough strains of Ayrshire, Holstein, Aberdeen Angus, and Highland cattle. One would expect this northern land to be mostly a pasture land; and pastures such as would be the envy of farmers in the black prairie of Illinois, or the bluegrass region of Kentucky, spread their lush green expanse over the Mackie holdings.

Maitland Mackie is beset by the same troubles that plague Henry Bennett in Kent on his 74 acres. Much feed, especially cereals and proteins, for his dairy cattle and his chickens and hogs must come from abroad. It is not only expensive, but he is continually faced by its sudden termination should a temperamental American Congress decide that aid to Europe has been exhausted. To provide against that bleak eventuality, the Scotch have been developing a grassland economy, which, to an American with his unlimited acres and resources, would seem almost miraculous. On 760 acres of the Mackie holdings there are 500 cattle and 4,000 chickens. This is a little less than one head of livestock per acre. This large livestock population is supported entirely for seven months of the year by home grown feed. Not only does Mackie propose to increase this to one animal per acre, but to raise enough high protein feed to last through the remaining four months and thus make him independent of imported feeds.

He is well along in his program. For three years some of his pastures have been supporting two animals per acre. When he can bring up the remaining pastures to the quality which he now uses for his dairy herd, he will be able to take off enough silage for winter feed from what is left. While his pasture management is the result of accumulated know-how dating back 450 years on the same farm, the ingredients of the management are understandable to every American farmer.

The Making Of Super-Pasture

Step one is the clearing of the land. American farmers understand this. While this clearing may have been done by the remote ancestors of Maitland Mackie, gorse and heather are still being dug out of the hillsides of his farm to provide new pastures. After the heather has been dug out and the stones hauled from the field, it is plowed and seeded. At seeding 700 pounds to the acre of a high analysis fertilizer is put down. The seeding mixture is as follows: 8 pounds of cocksfoot (orchard grass), 4 pounds timothy, 12 pounds rye grass, 3 pounds mixed white and red clover and 1 pound of a blue grass type of grass. This pasture will be fertilized twice during the first growing season. During the winter it will receive a generous application of barnyard manure. By the second spring it is ready for the livestock. If it is exceptionally good, one cutting will be taken off in the late spring for silage and it will then be pastured for the remainder of the grazing season, which lasts until late October.

Constant annual improvement on these pastures finally brings them to a level where an acre will support two animals from April to October. At the present time Mackie has 80 acres of this super-pasture. The 80 acres are divided into ten plots of eight acres each by an electric fence. When the grazing season starts in April 160 cows are turned into the first of the eight plots and permitted to graze 30 minutes after each milking, three times a day. Each plot is grazed eight days and the cows are then moved to the next plot. As each plot is vacated, it is given 300 pounds of "nitro chalk," a Scotch variety of 15½ per cent nitrogen fertilizer. Fertilization is continued in this manner until each plot has received 1500 pounds. During the grazing season the cows are fed draff (a type of distillers grain) at the rate of two pounds per day per cow. This is just enough to prevent bloat and to provide tone. Mackie has run check plots against this intensive program for three years and found that with rotational grazing and forced pastures he produces as much milk on 50 acres as he formerly produced on 88 under ordinary grazing. This releases 38 acres for grain or silage for winter use.

The Mackie cows are grade animals of the Holstein breed. Some years ago he crossed his British type Holstein cows with good Canadian Holstein bulls. This is the background of the present Mackie herds. These cows will weigh about 1200 pounds. The average milk production last year of 300 cows was 977 gallons per cow with an average 3.75 butter fat. They are milked three times a day for 305 days. This is not high production by American standards, but the Scotch Holstein is really a dual purpose animal. Dairy cows get only limited protein and would compare favorably in production with American cows if fed the same. Mackie's best cow is a fine bossy named Myrna. She has passed 75 British tons in 13 lactations. Her best year was her eighth when she exceeded 2,000 gallons.

Here's How You Can Have THE BEST FARM IN THE COUNTY!

BUT YOU MUST ACT NOW — BEFORE YOU ORDER YOUR FERTILIZER!

Soils change from year to year. That's why the right fertilizer for this year may be the *wrong* fertilizer for next year. You can't afford to guess. And there's only one positive way to find out! That's by making a soil test—NOW, before you order your fertilizer. Because a soil test tells you just what your soil needs *now* for bigger and better crops next year. The SUDBURY SOIL TEST KIT has been developed especially for *your* use, so you can make your own soil tests on the spot in a matter of minutes!

And *you don't have to be a chemist*, either—there's nothing to learn or memorize. You don't even need a pencil or paper. Every test is VISUAL—you see at a glance if your soil needs more nitrogen, for instance, and exactly *how much*. Or more phosphate or potash or lime. It's as simple as looking at a thermometer!

The SUPER-DE LUXE MODEL shown above is the product of years of development and research in soil testing equipment. Welded steel construction throughout to last a lifetime, yet light weight and easy to carry. Size 18¼" x 5¼" x 5¾". Handsome grey finish. Comes completely equipped with enough supplies (refillable) for hundreds of tests. Scientific charts included for every crop on your farm. Volume sales make possible our NEW LOW PRICE of only $24.95. Nothing more to buy. MONEY BACK GUARANTEE.

*Read What These Users Say

"Soil test kit showed potash badly needed . . . increased corn yield 20% . . . saved money on fertilizer."—R.S.C., Delphi, Ind.

"Kit has paid for itself over and over again . . . I have saved $2.00 to $4.00 an acre (on fertilizer)."—W.L.D., Harrisville, Pa.

"Have made many tests with your kit and like its simplicity and accuracy . . . worth 1,000 times its cost."—G.H., Bellevue, Ohio.

"With this knowledge (from use of soil test kit) . . . the result was to nearly double the usual yields."—S.G.H., Port Santac, Mich.

Names on request

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Box 317, South Sudbury, Mass.
Dealers, Distributors: Write for Special Offer

TEST YOUR SOIL

Do as *more than a quarter of a million* others have already done! Send for your SUDBURY SOIL TEST KIT *today*. It will be shipped to you promptly. As soon as you get it, make tests of each type of soil on your farm. These tests will show you the scientifically correct fertilizer to use on every type of soil.

Using the WRONG fertilizer is a waste of time and money, and you accomplish nothing. Using the RIGHT fertilizer (and nothing but a soil test can determine the RIGHT fertilizer) assures maximum yield in both quantity and quality. Fill out and mail the order blank below *today!*

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Sudbury SOIL TEST KITS

Have YOU Made a Soil Test Lately?

SUDBURY LABORATORY
Box 317, S. Sudbury, Mass.

Send the Super deLuxe Sudbury Soil Test Kit at the new special reduced price of $24.95.

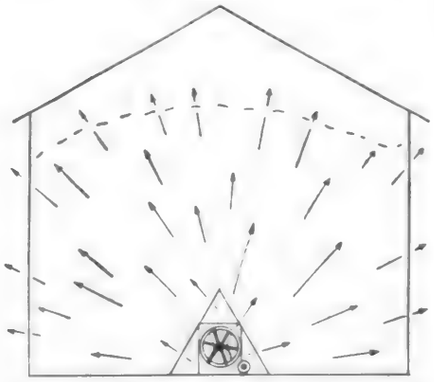
☐ Enclosed $..... Send prepaid ☐ Send C. O. D. plus postage

Name.....

R. D. or St.....

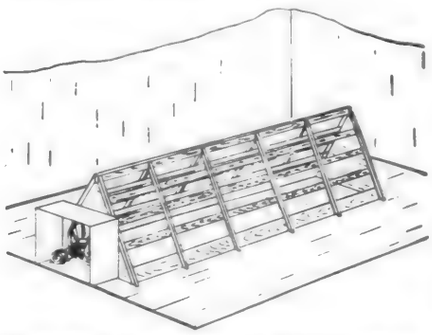
City..... State.....

Safe
GRAIN STORAGE



A Hartzell fan, properly installed in your present grain bin or crib, will give you plenty of air to dry any grain quickly and thoroughly. With it, you can combine small grain with a high moisture content, before danger of over-ripe straw. You can get corn out of the field long before time for seeding. At the same time, you'll insure grain which will not mold, which will test high, have higher feed value and sell at top prices. Above is sketched a typical Hartzell installation in a crib. Sketches of other type installations are available free at your Hartzell dealer—or write us.

Safe
HAY CURING



When you prepare to cure hay in the mow be sure that the fan you select delivers plenty of air, uses a minimum of current, will operate for years without trouble, and is fire-safe. Hartzell has designed and built propeller-type fans longer than any other maker, and was one of the first to produce mow-curing equipment. Hartzell fans have gained top place in industry because of their low power cost. Many Hartzell fans are running without trouble today after twenty years of use. Hartzell fans cannot "overload"—bog down under pressure and burn out. If you want the best in mow curing, you want Hartzell.

HARTZELL
PROPELLER FAN CO.
Agricultural Division
DEPT. L PIQUA, OHIO

He sells whole milk in bottles to the Aberdeen community. In connection with his dairy he operates a modern pasteurizing and bottling plant and makes his own deliveries.

He operates his 1,100 acres in three units with similar crop and livestock production. On one unit of 356 acres he has 40 acres in potatoes, 109 acres in wheat, 7 acres in kale, one acre in raspberries, 80 acres in silage grass and 119 acres in pastures. He ensiles first cuttings from most of his pastures, placing the silage in pits convenient to the dairy barn. No preservative is used. The grass is tramped well and when the pit is full, it is covered with sisal paper and then with concrete slabs which limits spoilage in a 200 ton pit to not more than two tons. The silage averages 15 per cent protein. He puts up about 1200 tons per year in pits which range in capacity from 200 tons to 450 tons.

In 1951 he proposes to eliminate entirely the purchase of feed with the exception of distillers grains. He plans to do this by mixing urea with molasses and feeding it with his silage and distillers grains. The idea of using urea as a substitute for the 16 per cent dairy mixture he is now buying came from America. He recently spent several months in the States and was quick to see the possibilities of urea as a protein source.

The development of urea at a reasonable price is a boon to the grass farmers of Scotland, where animal and vegetable proteins are scarce. With becoming modesty, Mackie says, "We can always learn something from American farmers. The urea idea which I picked up in America will increase profits on my dairy herd by one third. I don't understand why American dairymen are so slow to see the possibilities in feeding urea." What Mackie is too tactful to say is that American farmers are a generation behind in the development of pastures and the use of grass silage.

The Scotch farmer uses as much fertilizer as he can buy without going hungry himself; the American farmer is inclined to use as little as possible. The use of 1500 pounds of high nitrogen fertilizer per acre per year on pastures would be regarded in America as rank extravagance. It is not unusual in Great Britain.

The intensive nature of Mackie's dairy operation is carried over into his cropping. Last year his wheat averaged 74 bushels per acre and proportionate yields were taken off in oats and barley. He had 240 acres in the three grains. The wheat received 300 pounds of super phosphate when it was planted and was top dressed just before it headed with 300 pounds of 16 per cent nitrogen. While the wheat receives no manure, pastures in the rotation, as well as potatoes and beets, are heavily manured. On the Mackie home farm of 705 acres, 2000 tons of manure were produced last year. He used 600 tons of straw bedding.

How Is It Done?

How do these Europeans raise such phenomenal yields of wheat, and can an American farmer do likewise? There is no secret to 75 bushels of wheat in Scotland, nor the 85-90 bushels raised in some parts of Holland. We have the climate and the soil here in America to duplicate these yields, but it appears that we haven't the husbandry. Maitland Mackie's 75 bushel yield started with one of his remote ancestors and the answer here was manure. The Mackie wheat fields have a humus content of from 10 to 11 per cent. Many a top producing farmer in the Midwest brags to his neighbors if he can reach three per cent. Fertilizer is not stinted: the rotations include at least three years of grass; the seedbed is such a one as a floriculturist would prepare for a plot of prize roses. All these are important, but perhaps the most important, according to Maitland Mackie, is the manure which keeps his soil up to 11 per cent in humus content. Last season the state of Indiana conducted a prize wheat growing contest. The winner garnered 59 bushels to the acre from a 20 acre field and made newspaper headlines. In Holland the average yield is still greater than that in Scotland, but the Dutch cultivate their wheat at least twice during the growing season, and their polder soil is rich and deep. The Scotch do better with what they have to work with.

Total Mechanization

There isn't a horse on the Mackie acres. Fordson diesel tractors furnish the horse power for as complete a mechanization as one will find anywhere in the world. British agriculture has been almost completely mechanized on the theory that the pasture and feed that will keep a horse, which produces nothing but power, will keep a cow which produces both meat and milk. They have found no substitute for milk. The machinery on the Mackie farms includes two 12 foot combines, four large tractors and a number of smaller ones, king size drills and fertilizer spreaders, full haying equipment, including two grass silage loaders with an ingenious device to spit out the stones which are common enough on Scotch hillsides. The labor saving and automatic machinery around his dairy barns and farm buildings would be the envy of the most gadget-minded American. There is a fully equipped shop and an auxiliary electric power plant, just in case power lines to the farms should go down.

In addition to the production of milk and grain, the farm maintains a poultry operation of approximately 2500 laying hens in cages, all completely mechanized. The feeding is automatic by continuous cafeteria type of feeding unit and the entire chicken operation, from chicks to delivery of eggs, is operated by two men.

6-cylinder Ford Model F-2 shown has an 8-ft. Express Body mounted on a 122-inch wheelbase

"17 miles per gallon means I'm saving money with my new Ford!"

Says Vic Walz of Neligh, Nebraska

"After 100,000 miles I finally traded my old Ford for a new 6-cylinder Model F-2 Express. The new job performs even better than the old one. There's plenty of power when needed to get over icy and muddy roads. And its economy is saving me real money.

"I get a king-size load into my 8-ft. Express. And there's plenty of carrying-heft in the chassis." *Pay-load capacity of the 96-in. long, 54-in. wide F-2 Express is over 1,900 lbs. on 7.50-16 tires.*

"Power is never lacking for the biggest and toughest kind of a haul," Walz tells Ford Dealer Contois. *Only Ford gives you a choice of V-8 or Six, four engines for over 175 models, 95-h.p. to 145-h.p.*

"'Sunday-go-to-meeting' kind of a cab, too. Real riding comfort and style." *Ford-welded, all-steel cab has Air Wing ventilators in door glass. Level Action cab suspension, lounge-type seats.*

"I saved money on the low Ford price, and it's a cinch I'll save a lot more on gas, oil and repairs." *Switch to economical Fords! Farmers everywhere find that Ford Trucks do more per dollar.*

WATCH for this sign . . .

It identifies thousands of truck users in the Ford Truck Economy Run. Every Ford Truck model . . . every important truck-using vocation is represented.

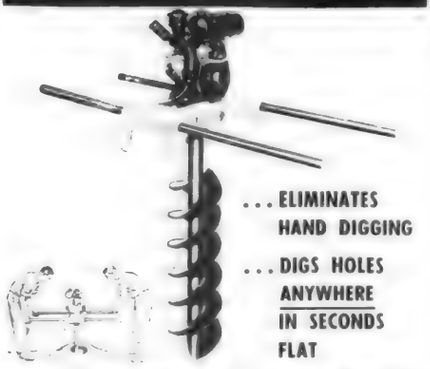
FORD TRUCK ECONOMY RUN

Ford Trucking Costs Less Because—

FORD TRUCKS LAST LONGER

Using latest registration data on 6,592,000 trucks, life insurance experts prove Ford Trucks last longer!

CHOREMASTER
POWER HOLE DIGGER



...ELIMINATES HAND DIGGING

...DIGS HOLES ANYWHERE IN SECONDS FLAT

Fencing, transplanting, repairs — any farm, nursery (or city) job requiring holes can be done far quicker — neater — more economically — with the CHOREMASTER Power Hole Digger. Hours of tedious hand digging are reduced to a few minutes by the self-contained, portable, power-driven CHOREMASTER Power Hole Digger. Hillsides, woods, gullies — no matter what the topography, if you can walk there, the light, sturdy CHOREMASTER will dig a hole for you.
If you already have a small gasoline engine, so much the better. The low-cost CHOREMASTER Power Hole Digger is available with or without engine. The 2HP, 9" auger model (illustrated) sells for only (with engine)... **$141.15**
3 HP, 9" auger, only (with engine).. **$178.15**
(prices FOB factory)
4" and 6" augers also available
ALSO SERVES AS AN EXCELLENT PORTABLE OR STATIONARY POWER UNIT

CHOREMASTER DIVISION
THE LODGE & SHIPLEY CO.
806-4 Evans St., Cincinnati 4, Ohio

FARMERS SING A SONG OF PROFITS WHEN THEY FEED THAT GRAIN-STRETCHING BLUE RIBBON CONDENSED BUTTERMILK TO THEIR PIGS AND POULTRY
BLUE RIBBON Special
FORTIFIED CONDENSED BUTTERMILK
WRITE US FOR PRICES
PLANTS THROUGHOUT THE CENTRAL WEST STATES
THE MERCHANTS CREAMERY CO.
536 Livingston St. Cincinnati 14, Ohio

Maitland Mackie and His Majesty's Government

Mackie's problems of quotas, ration coupons, marketing and government regulations are those of Henry Bennett in Kent, but in the case of the large farms they are multiplied many times over. Cereals, as well as manufactured feeds for livestock, are strictly rationed. The complexities of bureaucratic regulations are no less annoying to the British farmer than they are to his brothers of the sod in America. So involved are the regulations governing the rationing of livestock feed that most farmers find themselves spending more time on their books than they like. The amount of cow feed, for example, that a farmer can buy, is based on an involved formula, two factors of which are the size of the herd and the amount of milk production. This demands keeping books on every cow, but it has at least one good point—dead-heads and poor producers are quickly detected and culled out of the herd. The same applies to poultry feed, and in fact to all types of feed, the ingredients of which are imported or scarce. The ration regulations, however, have a certain flexibility which permits the good farmer to feed well enough to obtain average or better production. For instance, if a dairyman wishes to go into the hog business he can divert a certain amount of his whey to his hogs and by so doing get a bonus of ration coupons for cereals and supplement. Just how much extra he will receive is again figured out by a complicated formula.

Practically everything, except poultry and small fruits and vegetables, which the Mackies produce, must be sold at a fixed price to the government which in turn channels it through the various markets to the consumer. The government seasonally does a complicated juggling and wire walking act in setting the prices, attempting on the one hand to satisfy the farmer and on the other to provide food at a reasonable price to the consumer. Neither is completely satisfied, but most people in England believe the government is doing a fair job of giving everybody sufficient food at reasonable prices. It is when the cost of administration and subsidies is passed on to the taxpayer that the squawking becomes loud, sometimes loud enough to be heard in America.

How Much Does He Make?

A comparison of the gross income per acre between the American and British farms of the same size and type will show a slight edge to the British farm. This comes from the diversification and intensive methods of farming. It is not unusual for the larger farms to operate a full scale dairy, a pretentious poultry operation, and such high labor crops as potatoes, raspberries, turkeys, in addition to the grain crops, and hogs, and sheep. On a typical farm of this type, of 615 acres near Glasgow, there are 100 cows milking, 167 other cattle, including dry cows and heifers, 87 pigs, 8,000 chickens, 300 turkeys, 105 acres of potatoes, besides the usual crops of barley, turnips, oats and grass. There are 24 workmen on this farm. Married men live in cottages and the single men in a hostel, which is complete with recreation room and dining room. The gross income from this farm in 1949 was $109,000.00.

CONFERENCE, Mackie and his farm manager.

The biggest item of income was the milk check $43,400.00; then followed poultry and eggs $21,500.00; and potatoes $14,000.00.

The biggest expense items were feeds, seeds and purchased manure $32,000.00; wages and national health insurance $24,000.00, and repairs and new buildings $11,200.00.

Total outlay on the farm was $89,350.00, leaving a net income before taxes of $19,650.00. Of this amount the owner will pay 61 per cent in income taxes alone, or roughly $12,000.00, which leaves a take-home income of $7,650.00.

An American farmer with two children on the same income would have paid about $5,000.00. A net income of $7,650.00 on a 615 acre American farm would be regarded as small. On the Scottish farm the total production is much higher than the average American farm would make on the same acreage. The cost of feed and wages and the high income taxes were the three items that cut down the net profit on this farm.

Who can say which is the better off, the American farmer or the British farmer. Both are plagued by bureaucratic red tape; both are the victims of a cockeyed post war economy. A surprising number of British farmers would trade farms with Americans, not because they prefer our government, but because they still believe America is a land of milk and honey and easy money.

Editors Note: American farmers are beginning to learn that information on how to do a better job can profitably flow both ways across the Atlantic. American farmers are touring Europe in increasing numbers, bringing back new and useful practices. For those who would like to see first hand how British farmers operate, a visit to several European countries with a seven-to-nine-day-stop-over in Great Britain can be arranged by local travel agents. Information can be obtained by writing the British Travel Association, 336 Madison Avenue, New York. This agency will supply information about British agricultural societies who in turn will put Americans in touch with any particular aspect of farming in which they happen to be interested. A folder, "British Agriculture," is free on request.

An Invitation

FROM YOUR MASSEY-HARRIS DEALER

YOUR Massey-Harris Dealer wants you to know, through an actual demonstration, what great tractors the Massey-Harris are. He wants you to get up on one . . . drive it . . . to put it to any test you think a tractor should have. Just say the word, he'll arrange all details for this on-the-farm proof.

Not until you actually drive one will you have any real idea of the power, economy, ease of handling, and comfort features built into Massey-Harris Tractors.

A few trips up and down the field will tell you more than all the words we can write. That's why we want you to experience an actual in-the-field demonstration.

When you plow with a Massey-Harris Tractor you'll know the thrill of reserve power that carries you through a tough spot with ease . . . that keeps the job moving at top speed.

When you cultivate, you have the clear vision that makes good work easy. Yes! you can get right up close to the plants for clean cultivation without bobbing from side to side.

On a belt job, you'll see its wonderful smoothness under varying loads . . . how it will make short shift of your daily or weekly chore of feed grinding.

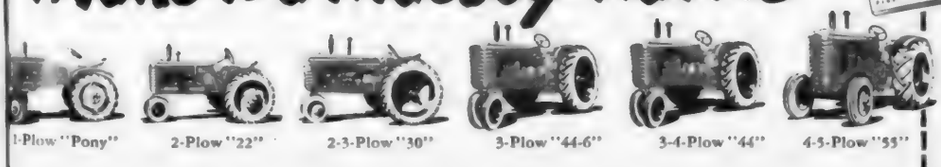
On *every* job, you'll have comfort that saves your arms and shoulders . . . simplicity of operation that helps maintain a fast pace all day long without fatigue.

You'll experience real fuel economy as you travel farther and do more work than you've done before with a given amount of fuel.

It's only through such an actual demonstration that you can appreciate fully the outstanding performance . . . the convenience . . . the comfort . . . the easy riding . . . the economy of operation — the advantages of all the many features that distinguish Massey-Harris Tractors.

Talk to your Massey-Harris Dealer. Tell him you want an on-the-farm demonstration. He'll be mighty glad to do this for you, as well as give you a copy of the latest tractor catalog. Among the six basic models there's a size and type to fit your farm. For a catalog by mail, send in the coupon below.

Make it a Massey-Harris



1-Plow "Pony" 2-Plow "22" 2-3-Plow "30" 3-Plow "44-6" 3-4-Plow "44" 4-5-Plow "55"

THE MASSEY-HARRIS COMPANY
Quality Avenue, Racine, Wis., Dept. J-222

Please send me a copy of your latest catalog of Massey-Harris Tractors.

Name .....
Please Print

Town ..... R.F.D. .....

County ..... State .....

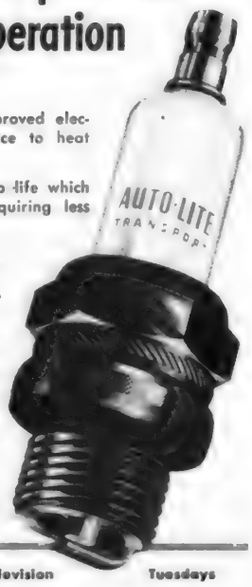
Which is really Linda Darnell?

Spark plugs also look alike, but

AUTO-LITE

TRANSPORT SPARK PLUGS

give you lowest cost per mile of spark plug operation



★ **AIRCRAFT TYPE INSULATOR**—improved electrical insulation offers maximum resistance to heat and reduces fouling.

★ **HEAVY ELECTRODES**—give long gap life which contributes to lower service costs by requiring less frequent gapping.

★ **RUGGED CONSTRUCTION**—makes them especially suitable for the most severe types of commercial and farm operation.

IF YOU know your stars of Hollywood, you will identify gorgeous Linda Darnell as the girl at the bottom. The girl at the top is lovely Marley Patteson of Bronxville, N. Y. You'll be correct, too, when you switch to Auto-Lite Transport Spark Plugs.

THE ELECTRIC AUTO-LITE COMPANY
Toledo 1, Ohio Toronto, Ontario
Auto-Lite Spark Plugs—Patented U.S.A.

Tune in "Suspense!"... CBS Radio Thursdays... CBS Television Tuesdays

COLOSSUS OF THE CROSSROADS

(Continued from page 47)

"You name it—we've got it," is considerably more than a slogan with a general store that deals in electric milkers and sport shirts, dog food and power lawn mowers, ladies' lingerie, paints and hardware, cow stanchions and bicycles.

Prices seem comparable to those of the average chain store, although by alert attention to market conditions and overstocked manufacturers or wholesalers, the Farm and Home quite regularly comes up with price specials so far below the normal wholesale price that envious competitors swear it can't be done.

However, when it comes to its own meats and poultry the Farm and Home Center management is satisfied to follow the current market price lines, and is not embarrassed if a competitive store shades their price by a few cents, asserting that their own meats and poultry just can't be compared with run-of-the-market products. Customers show their agreement by driving as much as 200 miles round trip to buy a week's supply of meat.

Florea, himself, or the head of his meat department, makes personal trips to farm suppliers to purchase livestock and poultry. Selling feed and giving advice on management and feeding, they have an intimate knowledge of the stock they buy. Farmers save transportation costs by selling their stock at the day's market quotation price in their own barnyards.

On busy nights, when shoppers outnumber customers ten to one, thousands of items are exposed to the pilfering tendencies of the American shopper. A detective is in the store on busy nights, but he finds only about two shoplifters a month. This is considered to be a very low catch for the size of the establishment and the number of shoppers. Theft is so small that it is not written off as an inventory loss. Florea says his clientele is better quality than they get in the city stores.

Some of the merchandise found on shoplifters is rather startling. Some women can't resist a thick T-bone steak or such little non-essential delicacies as olives. They occasionally pop these into their purses.

A star farmer himself before he was out of high school, 42-year old Don Florea became a feed salesman during the depression when the economic storm blasted him off a 360 acre rented farm at the age of 22.

He learned early that as a good crop springs only from a fertile field, the merchant can look for sales only after he's invested service, and that the prosperity of the farmer and the rural merchant is one and the same.

Helping farmers find the cause of trouble in the chicken yard, assisting a farmer's mare in difficult birth or castrating a ruptured hog, Florea got a chance to talk to even the busiest farmers. And while the farmer held the hog he had to listen to Florea's views about proper feeding and livestock management. Advice that worked was followed by sales.

However, personal contact with potential customers in the barnyard is only one form of sales promotion.

Airplanes equipped with loudspeakers fly over farmers working in their fields to announce to them as well as everyone else within a half mile area that the Farm and Home is holding a big sale on used farm machinery or baby chicks. One farmer filed a legal action claiming his hens were blasted out of their nests by the clamor from the skies.

A daily radio program over a station that reaches into three states calls customers to the mid-week jamboree with "two great free western rhythm shows" to entertain the shoppers.

A live pony to be given away to some lucky boy or girl is installed in the toy department at Christmas time. To close out the toy department auctioneers are hauled in from sheriff's sales and tobacco warehouses to run a marathon toy auction the week before Christmas.

One middle-aged man, entranced by the auction, staggered through the checkout stands with $200.00 worth of toys he'd successfully bid for. After he'd paid for the lot he announced that he couldn't figure out why he'd bought them since he didn't have any children. But he took them home anyway, and half the kids in his township got free gifts.

For 'round-the-farm hauling—plenty of load-pulling power in the field. For long highway hauls—plenty of hour-saving, money-saving speed.

TAKE the case of J. F. Steed, farmer-lumberman of Jackson, South Carolina:

His International trucks have to crawl into soft, boggy going to pull out logs—and have the pulling power to *keep* crawling. Then—be able to get up and go, to make time on long highway runs.

Eaton 2-Speed Axles do both jobs, save him money both ways. "I never have to worry about these trucks," says Mr. Steed. "Their Eaton 2-Speed Axles make rough going *easy* and smooth going *fast*."

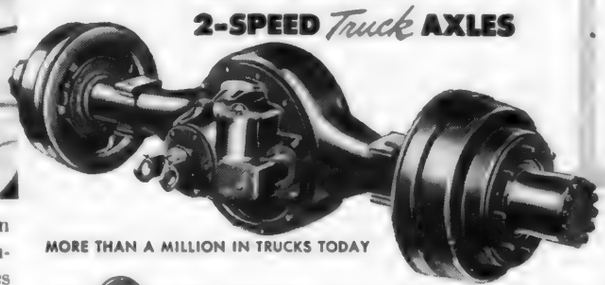
Eaton 2-Speed Axles double the number of gear ratios—they gear loads to roads. They're turning time into more money for farmers, ranchmen, truckmen —all over the country. Ask your dealer about them.

"We've sold 75 trucks with Eaton 2-Speed Axles because of the fine performance of the axle," says Roland Benson, sales manager, Morgan Truck and Tractor Company, International dealers, Augusta, Ga.

EATON

EATON MANUFACTURING COMPANY, CLEVELAND, OHIO

2-SPEED *Truck* AXLES



MORE THAN A MILLION IN TRUCKS TODAY

IT'S A SNAP TO SHIFT

1. MOVE BUTTON
2. PUSH PEDAL

and your speed ratios are now doubled

enabling you to match the load to the road saving engine, time and fuel.

Other EATON *Products:* Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Rotor Pumps • Conventional Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Spring Washers and Screw Assembly (Springtites) • Snap Rings Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

On warm summer nights the chant of the auctioneer draws 2500 persons to the flood-lit field beside the store. For a percentage of the sale price, the Farm and Home Center will sell anything. Farmers bring in everything from used extension ladders to bedroom suites—and spend the auction proceeds in the store. The curious, who just came to see, remain to buy.

The Farm and Home Center extends the use of the advertising columns in the store's monthly newspaper free to farmers wanting to sell their cordwood, livestock or farm equipment, often in direct competition with the store.

After shopping hours the Farm and Center restaurant and auditorium are made available to civic and farm organizations for their monthly meetings. The meat processing plant is placed at the disposal of livestock experts from Ohio State University for pork cut-out demonstrations during the butchering season.

Florea may be a shrewd businessman, with the grandiose concepts of a Hollywood publicity genius, but he doesn't look the part. His employees call him "Pop".

There's the twang of the farmer in his talk, and a farm boy's shyness in his smile. His 190 pounds on a five foot six inch frame give him an almost cherubic appearance. He seems less at home in his office than when he's plodding over a muddy barnyard in boots and overalls.

His devotion to farming and livestock raising goes back to a farm boyhood, and a high school project which enabled him to run a $45 investment in a breeding sow into a $1600 profit in three years.

Only once has he succeeded in living in town. He didn't like that and neither did his neighbors when they found that in addition to chickens, he was keeping a cow in his garage.

Now he lives with his wife and eleven children in the large white farmhouse behind the store, where in off-hours he can attend his 75 head of cattle, 250 hogs and a poultry population running to the tens of thousands. Frustrated as a boy in his efforts to win a pony in magazine contests, he now has a horse or pony for each of his 11 children, who learn to ride about as soon as they can walk.

Chain store executives from all over the country have visited the Farm and Home Center to seek the explanation for its phenomenal success, and they've left without the formula. Other merchants than Florea have had vivid imaginations and they've failed. Florea himself would probably grant that there are merchants who could teach him things about merchandising.

But there isn't a merchant in the country who can teach him anything about farming and livestock raising. He's the unique businessman who's a better farmer than the average farmer. He spends fully a third of his time answering calls for advice, often driving miles to look over a farmer's setup.

Six of his boys and girls work in the store at jobs ranging from carry-out boy to cooks in the doughnut kitchen. Nora Florea, just turned 19, the oldest child and a sophomore at Ohio State University, has mastered every operation of the store and can perform any task from runnnig the restaurant (a job she took over in high school), to cutting up a whole hog.

A deacon of the Church of Christ, who refuses to sell even beer in his store, Florea shares the concern of city and farm parents alike in providing recreational opportunities for today's youngsters.

And that concern will probably dictate the next development at the Farm and Home Center. Florea visualizes adding another story to the cornfield colossus which is now mostly one big room with a double height ceiling.

In that top story addition he plans to install bowling alleys, ping pong tables, dart games, a dance floor for supervised dances, and a soft drink bar—"a place where whole families could come for a good time in a nice respectable atmosphere."

THE AUTHOR: Tom McCarthy, for the past eleven years a news caster and news director for Radio, Cincinnati, WKRC, lives on a farm near Goshen, Ohio. He brings to his profession of news commentator and writer a varied and cosmopolitan background which includes the study of law, reporting for the Washington Post, and a tie rod trip across the country during the depression which he reported day by day for his paper. His radio farm hour, broadcast from his front porch, has become an early morning ritual for most of the farmers of the Ohio Valley.

Make Every Corn Acre Count... Plant **PIONEER** Corn

Winner of Official 1949 Corn Yield Tests and Contests in Seven States

ILLINOIS	Won 1949 Official Illinois Corn King 10-Acre Contest	**KENTUCKY**	Won 1949 Official Kentucky 5-Acre Corn Derby
INDIANA	Won Senior 1949 Official Indiana 5-Acre Contest.	**MICHIGAN**	Highest Official Yield in 1949 Michigan Overstate Trials
	Won Junior 1949 Official Indiana 5-Acre Contest.	**NEW JERSEY**	Highest Yield in 1949 Official New Jersey State Trials.
IOWA	Won 3 of the 4 sections in 1949 Iowa Corn Yield Test.	**Pennsylvania**	Highest yield in Official 1949 Pennsylvania 5-Acre Corn Growing Contest.

These competitive official corn yield tests and contests are open to all hybrids and are impartially conducted by state officials.

Plant *High Yielding* PIONEER This Year

SAVE UP TO 50%

ON FERTILIZING & SEEDING

with EZEE FLOW

Registered Trademark

See Why More Farmers Choose

EZEE FLOW

Than Any Other Spreader!

- **GUARANTEED** to spread any fertilizer in any condition (hard, lumpy, wet—even wet lime) uniformly and without clogging!
- **GUARANTEED** "exact rate" spreading. You "get what you set" from 10 to 4,000 lbs. per acre. Prevents waste . . . saves money!
- **GUARANTEED** "exact rate" sowing of grain, most legumes and grasses (even brome) . . . prevents waste, helps assure even stand!
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TOWN _____ STATE _____

SORGHUM: SILAGE OR GRAIN

(Continued from page 83)

leading varieties grown today are plants that have been developed within one of these families or by crossing between families.

Most sorghum is self pollinated, but it is an easy plant to cross breed. It also produces sports or mutations with great frequency. For these reasons there are a great many varieties of grain sorghums. Selecting from the mutations and natural crosses and also trying his own hand in creating new varieties, man has been aiming at a plant that is short enough to harvest with a combine, yields well, and is resistant to disease and insect pests. A dwarf plant found by a Texas farmer in his fields of tall sorghum and a double-dwarf plant discovered by an Arizona grower gave the plant breeders material to work with. Sorghums which grow 15 feet high in their original form and have to be broken down to reach the grain head have now been bred to produce grain a foot and a half to three feet from the ground.

The development of the combine varieties has revolutionized the growing of sorghum, changing it to a completely mechanized crop. Among the combine varieties are six that account for over 80 per cent of all the grain sorghum grown. They are: Westland, Martin Combine, Midland, Plainsman, Caprock, and Bonita. The first two of these, Westland and Martin Combine, were developed from Wheatland, a dwarf cross between varieties of the Milo and Kafir families, that was extremely popular until it was found to be highly susceptible to pythium root rot. Westland was a root rot resistant selection made by the Garden City, Kansas, Experiment Station. Martin Combine comes from a single healthy plant discovered by a Lubbock, Texas, farmer, W. P. Martin, in his fields of infected Wheatland. Both varieties mature in 100 to 105 days and produce reddish-brown seed.

Plainsman and Caprock were both developed by the Texas Experiment Station from crosses between members of the Kafir and Milo families. These two varieties are the heaviest yielders of the combine type sorghums. Plainsman, as a rule, outyielding Caprock—over a long period, tests in six different Texas substations showed Plainsman yielding 33 bushels to the acre as against 32.5 bushels for Caprock. Plainsman matures seed in 110 days and Caprock in 115.

Midland, like the others mentioned, is a kafir-milo cross. It was developed by the Kansas Experiment Station for the northern part of the sorghum region. Because it matures its grain in 100 days and grows well in this region, Midland has become the most popular variety for northern Kansas and Nebraska.

Bonita is a dwarf variety developed by the Texas Station from the hegari family and sometimes called Little Hegari. This variety has the juicy stalk of the hegari family and the somewhat erratic yield, doing extremely well at times and quite poorly at others. In the yield tests in the Texas substations, for example, Bonita ranged from an average of 42.9 bushels per acre at Chillicothe where it was the highest yielder to 13.8 bushels at Amarillo where it was the poorest yielder.

Members of the hegari and the kafir families, however, do not count on grain alone for their value. Though others of the grain sorghums are used for forage, these two are considered to be the best forage families among the grain producers. Their juicy, slightly sweet stalks and leafiness makes them almost dual purpose plants. In the dry areas where even sorghum growing is risky, members of the kafir and hegari families are planted and, if grain production fails, are harvested for forage or silage. In normal years when a grain crop is produced, it is a common practice to let cattle graze in the stubble or cut it for stover.

Half of the sorghum grown in this country is raised for forage or silage. Though some of this crop is made up of the grain sorghums the best forage plants are the sweet sorghums called sorgos. The area over which sorgo is grown is much larger and less concentrated than the grain sorghum country. This is because the sorgo crop does not need the same frost free growing period that the grain producers demand. With sorgo it isn't so important that the grain be allowed to ripen though full ripening adds to the feed value of the crop.

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RUSSELL HOLZ
RIPPEY, IOWA

June 23, 1950

Manager, Grain Dept.
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Dear Sir:

We have been feeding Super-Sol for about eighteen months, and our winnings at the major shows the past two seasons will confirm that our cattle had the necessary bloom and finish which is requisite of winners.

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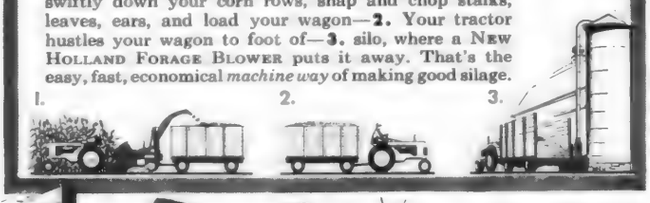
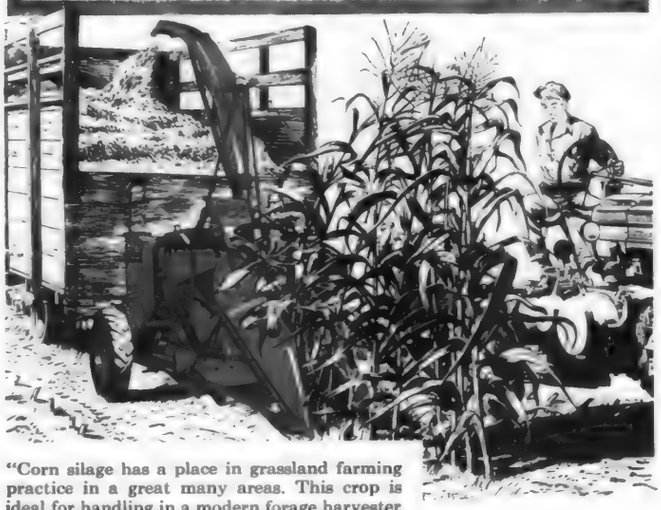
1. Let the NEW HOLLAND FORAGE HARVESTER roll swiftly down your corn rows, snap and chop stalks, leaves, ears, and load your wagon—**2.** Your tractor hustles your wagon to foot of—**3.** silo, where a NEW HOLLAND FORAGE BLOWER puts it away. That's the easy, fast, economical *machine way* of making good silage.





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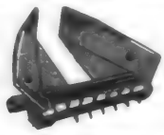

Windrow attachment for grass or hay. Special gentle lift fingers. Capacity 6 tons chopped dry or 8 tons of semi-cured hay per hour.

Model 680 FORAGE BLOWER

Tilt-table blower has 22" operating position. Moves up to 30 tons green chopped hay or 40 tons silage per hour. Wheels retract.

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Name_____ Acres Farmed?_____

Street or RFD_____ County_____ City_____ State_____

The sorgos are taller than grain sorghums, usually ranging from 6 to 14 feet, their stalks are thicker and juicier, and their grain head is smaller. The grain from most of these plants is less palatable than from grain sorghum.

The varieties that have been developed by the plant breeders differ in their soil and climatic requirements and so fit into the farming picture of different regions. Early varieties such as Minnesota Black Amber, Rancher, and Fremont are grown in the northern states and southern Canada. Further south, in the Kansas and Oklahoma latitudes, Sumac, Atlas, Kansas Orange, and Sourless are grown. And still further south Silvertop, Gooseneck, Honey, and Sugar Drip are the best varieties for the climate. As with any plant where varieties have been adapted to different local conditions, the farmer would do well to consult with his county agent.

Most of the sorgo grown in this country is harvested as fodder. When the crop has fairly matured and the seed is in the hard dough stage it is harvested with a corn binder and shocked. Because of the sirupy sap, sorgo takes a long time curing, three to five months. This throws the stacking job into the winter months when other work is not so pressing.

Often the corn binder is also used to cut sorgo for silage though this job has been completely mechanized by the use of forage harvesters which cut and chop the sorgo and blow the chopped material into a trailing wagon to be delivered to the silo. The addition of this labor saving method of harvesting and the realization that ensiling the crop preserves 50 per cent more feed value than it would have as fodder is causing farmers to increase the acreage of sorgo for silage.

Sorgo ensiles well, packing more tightly than corn, and, because of its sweet juice, making a less acid silage than corn. The ensiling process seems to destroy the danger of acid poisoning.

Unlike many crops, sorgo is best cut for fodder or for silage when it is fully matured. When it has reached this stage it not only yields the largest tonnage of dry matter, but also the largest per acre amounts of protein, carbohydrates, and fat. Additional arguments in favor of late harvesting are that the feed is more palatable at this time, it preserves better both as fodder and silage, and the plants contain less prussic acid.

Prussic acid is concentrated in the plant during the growing stages and makes the plant dangerous for livestock, particularly cattle and sheep. The poison is dangerous not only in young plants, but also in plants that have been retarded by drought or cold, and in early second growth and young branches and suckers. Livestock should never be turned onto fields that contain such plants. When a harvested grain field or other sorghum crop field is considered safe for pasturing, the stock should be given a light feeding of grain before they are turned onto the field. Even with these precautions it is always best to turn an animal of little value onto the field first in the role of the king's taster.

Stock that has been poisoned should be treated with an intravenous injection of sodium nitrite and sodium thiosulfate. The dosage is: two to three grams of sodium nitrite and two to three grams of sodium thiosulfate for sheep. These chemicals, however, are themselves dangerous to animals and should be administered by a trained veterinarian.

Considerable difference of opinion exists as to the value of sorgo fodder and silage as a feed. In the heart of the sorgo area, Kansas, five-year tests showed sorgo to be far ahead of corn as a silage feed on an acre basis. The results of this test showed that pound for pound corn was a slightly better feed than the sorgo, but an acre of sorgo produced 18.02 tons of silage to 11.81 tons for corn. This made it possible to produce 3,750 gallons of mik from an acre of sorgo silage where an acre of corn produced 2,750, and to make 1,850 pounds of beef on sorgo as compared to 1,315 pounds for corn.

At Purdue University, in Indiana, however, it was found that though sorgo still out-yielded corn at the rate of 15.9 tons to 11.4 tons to the acre, the corn was the more valuable crop. The average results of feeding tests on 12 lots of cattle over a two

year period showed silage to equal 71.1 of corn silage.

Perhaps the difference lies in the fact that one test was run in the sorgo country while the other was conducted in the heart of the corn belt. At any rate, some farmers, such as Leo Maxwell who farms in Kentucky on the border of both the corn and sorgo belt, plants both. Maxwell plants his corn at conventional distances and later seeds in sorgo at two inch spacing. "The crop I cut for silage," he says, "is thicker and heavier than a corn crop and more nutritious than straight sorgo silage. In addition to this I feel that I am getting some drought insurance by planting the sorgo—if the corn won't make it because of dry weather the sorgo is bound to produce some crop. You've got to watch your silo, though, if you have a wooden one because it packs down almost as heavy as grass silage."

Sorghum likes warm soil and is, therefore, one of the last crops to be put into the ground. Time of planting will differ in different parts of the country, but a safe rule of thumb is that it should not be planted earlier than two weeks after corn planting time. In the deep south where the sorghum midge attacks the crop, earlier planting is recommended to get the plants grown before the danger period. This late planting makes sorghum a good catch crop. This year the farmers of the southwest who lost their winter wheat crop had plenty of time to put in sorghum after the wheat failure was realized.

Planting and cultivating sorghum and sorgo is done with the same equipment and in the same fashion as corn. With sorghum grown for grain a spacing of six to eight inches between plants is desirable while a spacing of two to three inches is best for sorgo. Suitable plates for a corn planter can be secured for this planting. Because of the growth habits of the plant, this spacing should be considered only a general rule. With some varieties, such as Milo, the planting should be thin because the plant suckers freely and will put up the number and size of heads that are warranted by the amount of moisture present.

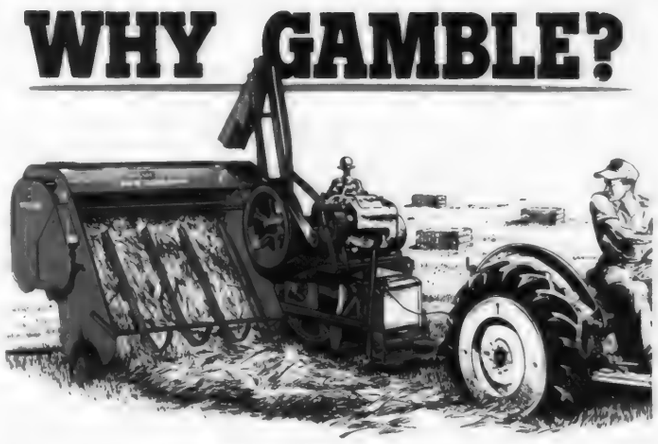
Occasionally sorgo is planted as a hay crop in which case it is seeded with a gain drill or broadcast. The resulting thick growing crop is harvested when it is fully matured by cutting with a mower and allowing to cure. The curing process, as with fodder, takes a long time—two days in the swath, four in the windrow, and two or three months in the cock before stacking.

The chief virtue of the crop, its ability to make use of every available drop of water, is ironically enough one of the factors that cause farmers to criticize sorghum. For when the sorghum crop has finished growing it has used up all the available water in the soil and crops that follow it in the rotation are bound to suffer. A second factor that makes it a difficult crop to fit into the rotation is that its roots seem to tie up all of the nitrogen in the soil by causing bacteria to increase in numbers and consume the nitrogen. True, the nitrogen will later be released into the soil, but the crop following sorghum won't benefit by this. Winter wheat following sorghum suffers the most from this trait. To overcome the disadvantage farmers fertilize more heavily with a nitrogen fertilizer and plant a spring crop following sorghum or let the land lie fallow.

Sorghum, like other plants, falls victim to diseases and bugs, many of which are the same varieties that attack corn such as the earworm and corn borer. Those of the rusts, smuts, molds, and blights that can be controlled by the farmer are attacked by treating the seed with a formaldehyde solution or with dust treatments such as copper carbonate, sulphur, and Ceresan. For the sorghum midge, however, there seems to be one method of avoiding damage: plant early. Planting early will itself cut down on the yield, but where the midge is present in large numbers, early planting will make a small crop possible.

With all its drawbacks, sorghum remains the mainstay of the livestock industry in a large section of the country. In the sorghum region it is an assured crop; in the corn belt it cannot compete with corn; and in border regions farmers may plant both crops to play it safe—these are the men who wear both a belt and suspenders and take no chances.

WHY GAMBLE?



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● The only **Baling Twine** with U. S. Testing Company seal of approval.

● **Tractor Saw,** tractor pulled. Easily detached for stationary sawing.

● **General Purpose Mixer** for a variety of farm uses.

● Power take-off **Side Delivery Rake** for leaf-saving raking and tedding.

● **Hammer Mill** . . . low cost grinding for roughage and grains.

● Power take-off **Manure Spreader.** Welded steel frame.

● Tilt-table **Forage Blower** moves up to 30 tons of green chopped hay per hour . . . 40 tons of silage.

● **Cylinder Corn Sheller** . . . shells 100 to 200 bushels per hour.

● Combination **Hay Chopper-Ensilage Cutter** handles up to 20 tons of silage per hour.

● **Red Rubber Belting,** variety of lengths and widths. Endless and roll types.

● **Bale Loader** . . . hitches to truck or wagon and picks up bales, saving time, labor and money.

● **Husker-Sheller** shreds and separates husks from cobs, cleans and bags shelled corn.

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AC SPARK PLUGS

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION • FLINT 2, MICH.

 (Continued from page 67)

increasingly directing the farm's raw products into the mouth of the cow, with the assurance that they will come out from under her belly in a product immediately negotiable for cash.

The cow is a voracious animal, and the maintenance of a commercial dairy herd involved a substantial increase in crop production. My father had a ready solution for this. He bought more cows, on the theory that their manure would produce enough more hay to keep them. And we have continued to add cows, sometimes, in later years, to eat up the hay. Apparently not much more than a vicious circle involving a lot of work with a shovel and a dung fork. Anyhow, his theory worked. When I was nine years old (in 1897) I hauled the day's 200 quart production to the creamery in five milk cans loaded on the tail board of a buck-board wagon. In 1944 the farm reached a peak daily production of more than 1,800 quarts, with forty-seven cans loaded on a big truck. An increase of 900 per cent with little change in available acreage, illustrates the tremendous potentiality, of land pushed hard enough, and well enough nourished.

Cow manure is the substance of our continued and increased soil fertility. Deep grass root filled soil, induced by heavily manured hayfields, provides resistance to erosion: and, turned over, it furnishes a back log of humus for the growing of cultivated crops. Left to its own devices, the law of gravity would have taken the soil to the creek bed, leaving behind a stony barren waste. Without cow manure, this story never would have been written.

But there were many tools besides dung forks involved in this increasing volume. At about the turn of the century there came a literal flood of new devices for crop handling. The gravel reaper replaced the grain cradle and the hand rake, and was itself replaced almost immediately by the reaper and binder. Huge silos were built to store green fodder, and with them came the corn binder and the ensilage cutter with the endless carrier elevator; again quickly superseded by the blower. There was the thresher, first powered by the old treadmill on which two sweating horses plodded up hill all day getting nowhere and later by the miraculous one cylinder gas engine which usually had to be cranked for three hours every morning. Best of all, the old cross cut saw gave way to the power driven stationary drag saw and the buzz saw.

Little realizing that many of these gadgets would themselves become obsolete, my father was quick to seize upon all of them. And he began the practice of crop rotation, introducing commercial potato growing to prolong the cycle, and to provide an extra cash income. A significant sidelight on his determination to make the farm a successful enterprise is the fact that he stood quite alone in his early progress. Other nearby farms, perhaps more prudently managed, were slower to take on untried tools and methods. But they are not now Century Farms, most of them have changed hands many times without much increase in production. Many of them are abandoned.

Bankers Don't Milk Cows

Early in my career the family sequence of ownership was almost interrupted. With new brains which I had acquired in college, and with my father's resources and credit, we undertook a local wholesale and retail feed and grain business as a side issue. The grain business is a good line in these parts, and we did all right. But the terrific commodity deflation of 1920-21 put the business on the rocks. Though the farm was put up as partial security, it was not enough. We had to liquidate. Meantime, my father's health had broken down, and when the crash came, it looked as if the creditors would inherit the farm. Since the assets, including the farm, did not nearly equal the liabilities, bankruptcy, and the loss of the farm, seemed the only solution.

I would not take bankruptcy. On the basis of my counter proposal, an arrangement was finally made by which the creditors made some concessions on our business obligations and agreed to leave me in possession of the farm. In effect I became obligated to buy the farm for all it was worth and pay a bonus of nearly 100 per cent for the privilege. Some of my friends have

Successful!

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Be *sure* when you treat mastitis! Use Squibb Penicillin Ointment—the ointment which has effected a high percentage of recoveries in treating *millions of cases of mastitis** over the past two years.

These are the reasons for the success of this penicillin ointment:

- Thorough dispersion throughout entire treated quarter, reaching the infection no matter where it may be in the quarter.
- Attacks mastitis* organisms over a period of from 48 to 72 hours—without interfering with regular milking.
- Usually, only one tube is necessary for successful treatment.
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THOROUGH PENICILLIN DISPERSION

with prolonged action up to 72 hours!

Note, in the cross-section photograph above, how Squibb Ointment disperses penicillin throughout a treated quarter. One tube of Squibb Ointment, containing a dye instead of penicillin, was instilled into one quarter of a cow's udder. The cow was killed 17 hours later—the udder removed and frozen—and the photograph taken.

* due to *Streptococcus agalactiae*, the cause of the largest percentage of all mastitis cases.

SQUIBB - A NAME YOU CAN TRUST

Which is really Gene Tierney?

Batteries also look alike but AUTO-LITE STA-FUL

NEEDS WATER ONLY 3 TIMES A YEAR!

IN NORMAL CAR USE

BATTERIES do look alike, so install Auto-Lite "Sta-ful," to get the battery that needs water only 3 times a year in normal car use. For the real Gene Tierney, star of "Where the Sidewalk Ends," a 20th Century-Fox production, pick the bottom picture. Lovely Geraldine Noonan of New York City is above. Remember, be wise—buy an Auto-Lite "Sta-ful."

AUTO-LITE BATTERY CORPORATION
Toledo 1 Ohio

Tune in "Suspense!"...CBS Radio Thursdays...CBS Television Tuesdays

AUTO-LITE sta-ful

70% Longer Average Life*

*In tests conducted according to S.A.E. Life Cycle Standards

given me credit for unusual honesty on this score; but that wasn't it. My love for the farm made me stubborn—and I was ignorant too. For if I had known then what was finally to be involved, I never would have undertaken it. For more than twenty years it was a narrow squeak.

One year the bovine tuberculin test took 135 of our dairy cows on one confiscation order, putting us out of production for a year. Three years later a big fire destroyed the main dairy barn with all the winter fodder. Again we had to sell the cows at a sacrifice, and again were out of production while we built a barn and grew feed. Ice storms and maple worms ruined many of our maple trees, cutting our maple syrup production in half. And, added to all this, along came new hard times.

In 1932, the price of milk dropped to a dollar a hundred wholesale, two and one half cents per quart. But the great depression didn't take any of us farmers down too much. We were already there. Even reassuring was the fact that our disadvantage was ironed out in the general pocketbook flattening. New York farmers never joined the pitch fork brigade which resisted mortgage foreclosures in the middle west. For my part, I intimated to my bankers more than once that they would have to take over. Unused to cow milking, they declined the opportunity. Since the cows had to be milked, I kept desperately on.

I always had an unorthodox theory that the first objective for farm profits was land maintenance and expansion of farm production. In the thin years this left little or nothing to apply on debts, and sometimes even the taxes and mortgage interest went unpaid. The Land Bank agent had very orthodox ideas on financing, and we sometimes met head on because I bought a new tractor with money that should have been paid to him for tax and interest arrears. He was probably right, but somehow out of the extra crop the tractor produced I managed to get enough money to keep him quiet and I had the tractor left over. When the good years finally came along, our land and equipment were ready for full production.

In addition to the difficulties which involved finance, there was a new phase of the war on the stones. The advent of the sulky plow, which was mounted on wheels and which could be rigidly adjusted for deep plowing, was the first modern tool to show up the complete inadequacy of what had appeared to be a finished job. This plow, running along at an exact even depth, turned out a new crop of stones—multitude of them—of varying sizes, some as big as a washtub. These had been left out of the original clearing because they were just out of sight under the surface. The old hand plows had slipped over or around them, and they had been left in quiet hibernation. But the ruthless wheel plow stirred them up, and they came out of the earth bringing their young with them. We actually hesitated to do the usual season's plowing because so many stones had to be picked before the crops could go on.

Then, too, there was the problem of disposing of them. This was most conveniently solved at first by adding them to the width of the old walls, a costly expedient, as it later turned out. The tractor plow did a more thorough uprooting job than the horse drawn sulky plow, adding a worse penalty in the fields. And the tractor, with its other attending tools, gave us the evidence of need for the biggest undertaking of all. In the small fields, so much room was needed, and so much time required, for turning the tractor drawn machinery at the headlands, that the walls themselves must now surely be moved to save time and space. And, since it would take time to move them, and space to put them on the advantage seemed doubtful.

The confusion solved itself with the rapid advent of more new tools. Dump wagons, even dump trucks, were available. And the tractor, which had initiated much of the difficulty, made the largest contribution to the solution of it. With a heavy chain, the crawler would pull and haul away without splitting, rocks as large as itself. For the very large rocks, which had defied all previous devices, we began to use dynamite. So it was that we were able to adapt circumstances to needs, and before very long we were engaged in a systematic cleanup which involved all the stones which had been accumulating in the walls for one hundred years, and also the tremendously greater number which

"A Miracle IN STORM-FLATTENED CORN AND SORGHUM"

. . . writes gratified user

"On Aug. 28, 1949, the country between Topeka and Kansas City, Kansas, was hit by a severe wind and hail storm that everyone thought completely ruined all corn and sorgo for silos. . . . We decided, when we saw what was left of the corn fields, that our silo-filling season was over," says Robert Peterson in a letter about his Case Forage Harvester.

"However, the owners of these fields were desperate so we started in. . . . The corn and sorgo were laid flat on the ground . . . you couldn't see which way the rows ran. . . . The way this Case handled these fields was a miracle. . . .

"We had to work fast because the material began to rot and sour rapidly and the owners pushed us to get it in the silo. Other makes of harvester would not pick up these crops and every one was amazed at how we could clean up a field.

"About 10 of these farmers wanted me to write and tell this story . . . said they wouldn't have had any feed if it hadn't been for our Case. We don't think you brag enough on this harvester."

✓ **LIGHT RUNNING.** Makes good use of 2-plow tractor power on the power take-off, yet has the strength and capacity to cut big tonnage with bigger tractors. Also available with engine.

✓ **ONE BASIC MACHINE.** Built to work equally well in row crops or hay crops, with interchangeable units. Simple in design, staunchly built for years of dependable service with little upkeep.

✓ **HANDLES ALL FORAGE CROPS.** Corn, sorghum, soybeans—green, wilted, or cured hay—windrowed straw. Order it with row-crop or windrow pick-up unit, or both. Limited number of cutter-bar units available.

✓ **EASY TO USE.** Over-running clutch lets you get knife wheel up to speed before starting travel. Control lever handy to tractor driver. Can be fitted for hydraulic control.

"SIMPLEST FIELD-FORAGE HARVESTER MADE," users say. Simple design uses strong, long-lasting parts—few things to need care. Anti-friction bearings make it last long, pull easy. Two-way delivery pipe loads wagon pulled behind or truck driven alongside. Rope-controlled deflector fills front, middle, and rear. See your Case dealer about it. Be sure to use coupon.

PASTE ON PENNY POSTCARD AND MAIL

Mark machines that interest you; write in margin any others you may need; tear out and mail to J. I. Case Co., Dept. J-90, Racine, Wis.

- ☐ Forage Harvester
- ☐ Forage Blower
- ☐ "NCM" Field Baler—Ventilated Bales
- ☐ Grain Drills
- ☐ Combines
- ☐ Disk Plows
- ☐ Corn Pickers

NAME _____

POSTOFFICE _____

RFD _____ STATE _____

were now coming out of the sub surface.

Fortunately, perhaps, we were having another difficulty just then in hauling supplies to the fields and the harvests away from the fields on the trucks. They were stuck in the mud every time it rained. In order to keep the trucks moving, we had to haul stones in to fill up the mudholes. This necessity prompted us into a very quick decision, and a permanent plan. We would use the whole works to build solid frost proof and rain proof roads. The walls and rocks are gone from our big fields today, and there are a half dozen stone roads leading to various areas, over which trucks and loaded tractor drawn vehicles can go any day in the year. Some of the roads run over a bed ten feet wide and four feet deep.

FARM MANAGEMENT SERVICE For

Southern Ohio, Northern Kentucky, Central Indiana and Central Illinois Farm Owners.

Opekasit Farm Management service will help you operate your farm with maximum profit. Our trained personnel is equipped to supervise entire farm operations including:

PLANNING **SURVEYS**
BUDGETING **ACCOUNTING**

WRITE FOR DETAILS

OPEKASIT
LEBANON, OHIO

(Other offices at So. Charleston and Hamilton, Ohio and Crawfordsville, Indiana)

We Don't Contour

The most significant single area in this later land clearing is a hundred acre tract which we call The Big Hill. A sprawling plot, with many steep places, it now constitutes the main crop field in our enterprise. In rotation, it has latitude enough to provide an annual twenty acre crop of cauliflower, now our cash crop, with corn, oats, and two years of hay leading into it.

In the story of hill farming one question always comes up: What do we do about contouring? It is a good question: and here is the answer. We do not undertake it here.

Though our land is hilly and rolling, and apparently a proper subject for contouring, our experience with cultivated crops during the terrific thunder storms and cloudbursts, which are common to our mountainous country, led us to fear it. In contouring our field, to get reasonable row length, we have to run the rows crosswise, the full width of the field. Our experience with this—we have tried it—is that the great volume of water which accumulates quickly in heavy showers will follow the rows horizontally, even though the slope is gradual, collecting from both directions at one or two low points on the line, where it will break through, sometimes tearing a gully deep enough to bury a freight car.

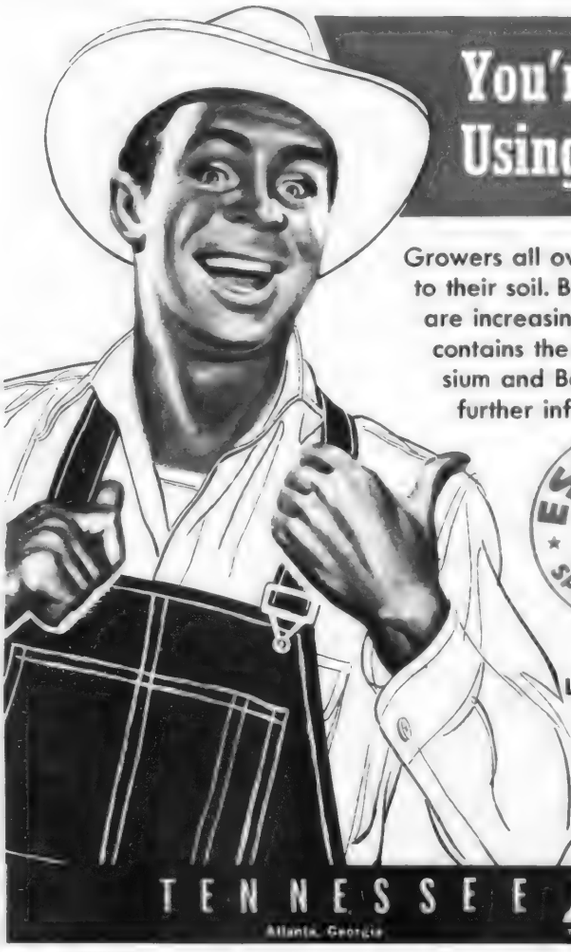
A few disastrous experiences of this sort have taught us that, when the rows run crosswise and counter to the natural flow of the water, the erosion becomes destructively concentrated rather than localized. In the old days, when the cross fences in the big field provided artificial dikes in line with the contour, the washouts at low points tore the very walls out.

We have gone back to the up and down layout in rotation, and our erosion difficulties have been greatly minimized. The little furrows, opened by the cultivators between each row, carry the run off water in little harmless streams with not much damage. Erosion is the number one enemy of the farmer and the loss is constant in any system of cultivation. That contouring has contributed much to its control, is well established. What is written here is not intended as a contradiction: it is merely the recital of practices which make crops on The Taylor Farm.

The Farm Today

As eastern farms go, we have enough to work with. The farm now contains 502 acres and includes nine separate purchases, made at various times, all adjoining the original one hundred acres. Six houses provide living quarters for the owners and the workers, and out buildings are adequate for the housing of two hundred head of cattle, machinery, equipment and supplies.

The working equipment includes nearly



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Growers all over the nation are using ES-MIN-EL to return essential mineral elements to their soil. By returning to the soil essential minerals, these growers, in most cases, are increasing production and producing healthier crops rich in vitamins. ES-MIN-EL contains the essential mineral elements of Manganese, Copper, Iron, Zinc, Magnesium and Boron. It is available in 5 lb. bags, 100 lb. bags or in carload lots. For further information write us today.

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IF your soil was not properly mineralized before planting you can now get the new ES-MIN-EL for use in dusting or spraying—you can now feed your growing plants these essential mineral elements through the leaves and stems by applying an application of the new form of ES-MIN-EL used for spraying and dusting only. ES-MIN-EL spray or dust is a neutral form of Copper, Manganese and Zinc.

FREE BOOKLET

Let us send you our Free Booklet on ES-MIN-EL. Send a card or letter to: Tennessee Corporation, Grant Building, Atlanta, Georgia or Lockland, Ohio.

FRUITS AND VEGETABLES RICH IN VITAMINS CANNOT GROW IN SOIL POOR IN MINERALS

TENNESSEE TC CORPORATION

Atlanta, Georgia — TENNESSEE CORPORATION — Lockland, Ohio

every modern device which can be adapted to our needs and our rugged landscape. Three big transport trucks, a dump truck and four tractors, and two teams of horses for winter emergencies and special jobs, provide the motive power. There is a transplanter, a grain drill, a corn planter, and a power cultivator. Complete haying tools include a tractor mower, a side delivery rake, a pick-up baler and power hoists at the barns. Other harvesting machinery for corn and oats is adequate, though we have not yet adaped our routine to the field chopper or the combine.

The most significant innovation, and very unusual for this stony soil, is the rotary tiller, which has replaced the plows and harrows. With this machine, land preparation is completed in one operation. A great time saver, its chief advantage is that it avoids the soil packing which is incident to repeated harrowing.

Three Thousand Buckets

No description of our work is complete without mention of the maple trees, whose product has been an important contributor to the farm income since the very first days. Native to this part of the country, maples seed themselves and grow prolifically wherever pasture and cultivation do not interfere with the young shoots. Large areas of the farm, too rough or too remote ever to have been cleared, are covered with maples, many of them two or three hundred years old. In addition to these there are many hundreds which were set out with much labor and care by my ancestors along roadways and around buildings. Many of these have been growing for more than a century, and, in addition to the adornment and shade and wind protection which they provide, they add materially to the maple products. Altogether we have about three thousand producing trees.

The substantial modern equipment for maple syrup and sugar making is no set of toys. There are three thousand bucket and spouts, and a big automatic evaporator and a sugar cooker and a power stirring machine.

Though the gross income from maple syrup and sugar is relatively small among our products, the assurance of net profit is greater than for any other enterprise we have. Our retail distribution extends to nearly every state in the union, some of our island possessions, and the District of Columbia, where one of our receivers is the President of the United States, who has been on our shipping list longer than he has been president.

No Dowries

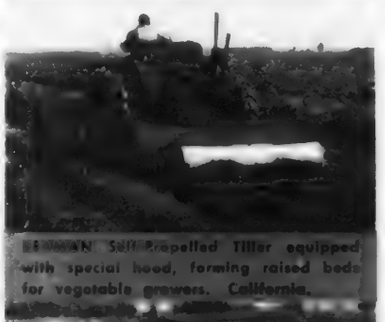
The Taylor Farm is not only a place of activity, of growing things, and machinery working. It is, in fact, a small community. The farm census is variable in different seasons and different years, but the half dozen families who live here together with unattached workers give us a farm family running sometimes to thirty-five persons—all of whom get their living here. All of them, except the little folks, may find

Geared for Cost-Cutting on the BIG, TOUGH TILLAGE JOBS!

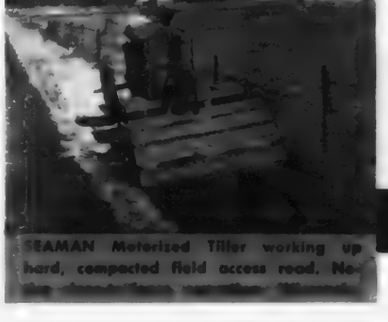
THE NEW SEAMAN Self-Propelled ROTARY TILLER

SEAMAN Motorized Tiller milling and ... in ... Arizona.

SEAMAN Motorized Tiller producing coarse, cloddy, tillage in pasture renova-



SEAMAN Self-Propelled Tiller equipped with special hood, forming raised beds for vegetable growers. California.



SEAMAN Motorized Tiller working up hard, compacted field access road. No-

"Geared" is literally true—for the SEAMAN *Self-Propelled* TILLER has a selective speed gear shift transmission that gives you a wide range in speeds of forward travel to meet every tillage condition. **Medium, fine or coarse** tillage is at your command. Tillage in **rocky fields, heavy cover, tough, root-bound sod** is simply a matter of forward speed adjustment.

SEAMAN Self-Propelled handles difficult **pasture renovation** often impossible with other equipment. In **brush clearance** it even cuts up small saplings and digs up roots.

SEAMAN-Tillage markedly improves soil by encouraging greater humus development. Tillage holds more moisture, is better aerated, combats erosion and promotes earlier, more uniform seed germination. SEAMAN-Tillage is complete tillage—usually produced in only one trip. And the Self-Propelled unit frees your tractors for other work.

Make your farming more profitable with the SEAMAN TILLER.

This FREE book "Benefits of Rotary Tillage" is most detailed and comprehensive ever published. Send for your copy now.

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MORE YIELD
PER ACRE
Through Soil Conservation

The Danuser All-Purpose Blade, a practical, versatile aid in modern soil conservation . . . protects and saves your valuable top soil by terracing, grading, backfilling, and scraping.
Quickly and easily installed on popular makes of tractors, the Danuser Blade is designed for fast one-man operation. Engineered for **rough, tough** work . . . it does the job economically! Rugged and durable—blade can also be used for bull-dozing, clearing roads and ditching. Write Dept. U.

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Mr. Stockman, YOU CAN VACCINATE your own HOGS!

VACCINATION HELPS TO INSURE PROFITS

Every efficient hog raising program includes immunization against diseases commonly affecting swine. NO program is complete . . . NO investment is secure without vaccination. More stockmen regard vaccination as "profit insurance". More stockmen are doing their own vaccination. More stockmen use more Anchor Anti-hog Cholera Serum than any other serum in the world.

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Many hog raisers prefer to do their own vaccinating because of timeliness, weather conditions and the economic factor. More and more hog raisers are turning to the Anchor Serum Company to provide them with the correct information and materials to do this vital vaccination job, because Anchor knows the way . . . Anchor shows the way to healthier hogs and greater hog profits.

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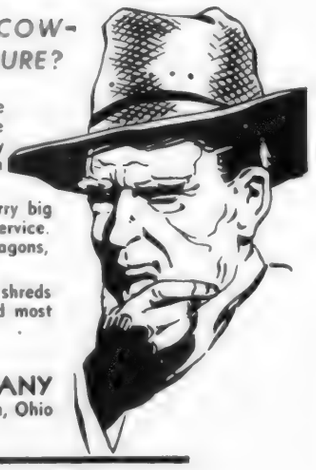
ARE YOU WORRIED ?

-- ABOUT HOW TO KEEP YOUR COW-BARN AND YARD CLEAR OF MANURE?



Many state dairy laws require daily removal of manure from the barn and cow yard. If you make use of the manure for fertilizer, the only way this can be done every day in the year, over wet or snow-covered fields, is with a Cobey Power-Driven Spreader.

Cobey Power-Driven Spreaders are ruggedly built to carry big loads at high speeds, and will give years of long, hard service. Cobey Spreaders also can be used as self-unloading wagons, giving you two implements for the price of one.

Tests have proved that the Cobey Power-Driven Spreader shreds the manure finest and the spread pattern is widest and most uniform of all leading competitive spreaders.

Return the coupon for complete information.

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Cobey POWER DRIVEN Spreader **3 SIZES**

Trade mark Reg. U. S. Pat Off.

Patents granted & pending.

MODEL 75 – – Capacity *75 bu.

MODEL 100– – Capacity *100 bu.

*With extension sides for use as self-unloading wagon.

MODEL 150 -- Capacity *150 bu.

THE PERFECTION STEEL BODY COMPANY
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☐ Power Driven Spreaders ☐ 11-A, Wagon Gear
☐ 31-A, Dump Wagon ☐ Utility Wagon Boxes
☐ 21-A, Hi-Speed Wagon ☐ 2-Wheel Trailer
☐ 2-Wheel Tilting Platform Wagon

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employment at some farm job, either seasonal or regular, so that we all manage to live fairly well. Work opportunities are pooled for the benefit of the families who live on the farm, so far as they are able to fill them, thus stabilizing our labor supply and their living.

Any discussion of profits for the farm is largely academic. Somehow, our books never show any cash balance at the end of the year. We always put everything we make into the enterprise, and grab our maintenance as we go. So much for the farm living; we get along. Quoted by our sponsor in the Century Citation was the following:

"All new purchases and all financial losses throughout the entire period of ownership have been financed entirely by the earnings of the farm. No outside money has ever been earned by any of the proprietors, and no new money has ever been introduced into the enterprise either by marriage or otherwise. Annual (gross) income reached a high of $78,000 in 1944."

The succession of ownership has been a prearranged, inside job for five generations. The surrogates court never got a chance to rule on it. Since 1946 the operation has been in the hands of my daughter and her husband. (Though his immediate background was to pilot 32 bombing missions over Hitler's Germany, he is strictly a farm bred boy.) They operate under a lease, with an air tight option to purchase. Only the sheriff can stop them from the succession if they elect to assume it.

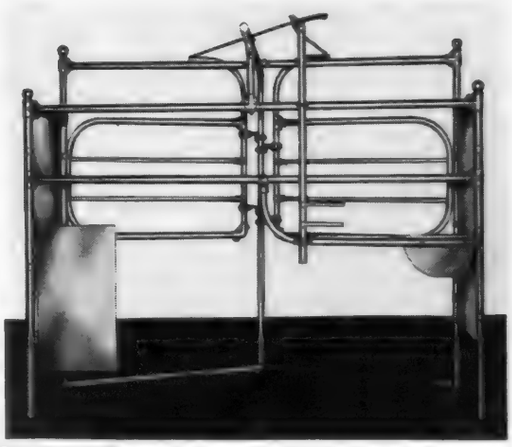
Reflecting on what has been written here, I am reminded that the cartoonists always draw the the farmer with a straw in his mouth, wearing a battered old hat and a ragged baggy old pair of overalls. I note statistics showing that, despite their improved individual status, the American farmers support more than 25 per cent of the population while receiving less than 9 per cent of the aggregate national income. And, without reference to pictures and print, I visualize countless thousands of uncut hayfields and abandoned farm buildings all over the northeast, bearing mute testimony to the unwillingness of easy living Americans to make the sacrifice involved in farming this rugged country. I realize that the bright boys are inevitably attracted to urban life where opulence for labor as well as management is glorified in a new industrial aristocracy.

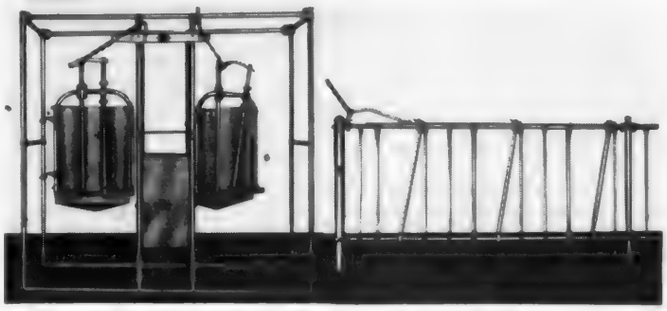
But, remembering the Century Citation, I recognize an antithesis. Our farm was honored for its success, and implicit in the honor to five generations of us who have staid home, produced the food for the gadabouts and battled the rocks.

THE AUTHOR: Much of the life story of George D. Taylor is told or implied in his article. He was born on the Century Farm, left it for a few years to attend Brown University, and was the fourth Taylor to own and operate it. Since retiring from active operation of the farm his life has been a busy one. In addition to his article for *The Farm Quarterly*, he has published a book, *These Hills Are Not Barren*, and has been elected District Governor of the Rotary International, one of the few farmers to be so honored.

HUDSON HAS WHAT IT TAKES!

Every type of stall needed or preferred by any dairy farmer anywhere!



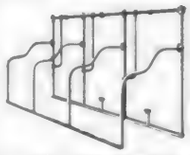


Twin Unit Walk-Thru Stall. Durably built of high carbon steel tubing. Easy-to-reach gate control levers at rear of stall. Reinforced uprights, sag-proof gates, fittings all aluminized for rust-resistance. Available in one or more double units. All uprights extra-reinforced in concrete with Hudson *Angle Anchors*.

Hudson Panel Stalls. Easy-operating master lever locks or releases all stanchions at once, or each stanchion may be operated individually. Rust-resisting aluminized stall tubing throughout. Panel stalls are shipped assembled in 9-foot sections of 3 stalls each; additional panels are easily attached.

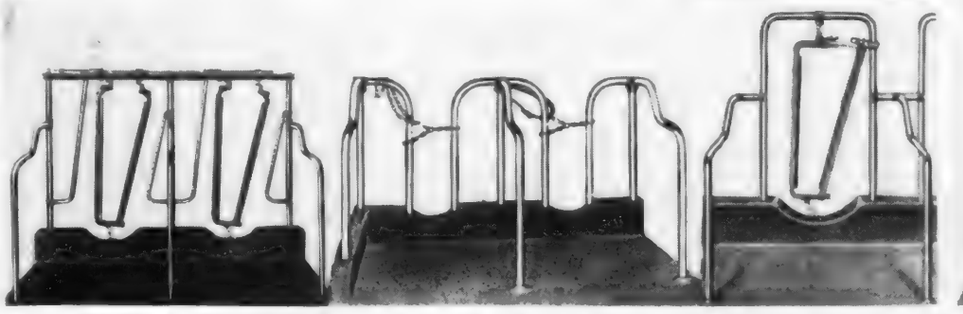
SAVE $2.50 – $3.00
Per Stall

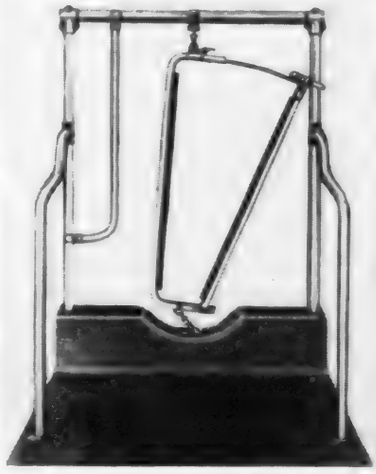
Hudson's pre-assembling of stalls saves you time and money – cuts installation costs



on each stall. Complete instructions and diagrams for assembly and installation sent with stalls.

Hudson Tandem Milking Stall. Designed for long, efficient service; cleaner, easier milking. High carbon steel tubing. Hudson aluminized finish combines rust-resistance with a sparkling appearance. Sag-proof gates, hung on reinforced frames, are controlled easily by levers on the operator's side. Hudson's specially designed *Angle Anchors* reinforce gate frames in concrete and assure fine alignment always.





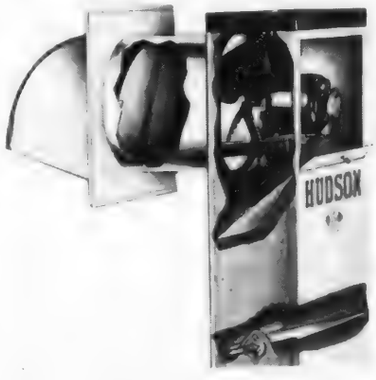
Lever Operated Stall. Smoothest and easiest operating lever-operated stall built. Close or open all stanchions in the line with a single lever; or release or hold one or any number of cows as desired. All high carbon steel tubing with aluminized rust-resisting finish.

Hudson Tie Stall offers cow comfort and ample protection. Uprights and partitions are reinforced by Hudson *Angle Anchors* for easy, low-cost installation and lasting strength. High carbon steel tubing, tight sanitary fittings, with rust-resisting aluminized finish

Hudson Arch Stall. Reinforced uprights and partitions, strong high carbon steel tubing, one-piece arch, and tight fittings make this the strongest arch stall built. Shipped already assembled in batteries. Each stall is a complete unit; extra stalls easily added.

Continuous Top Rail Stall. Excels in cow comfort, protection, strength and ease of installation. High carbon steel tubing, strong fittings. Reinforced throughout with *Angle Anchors* to cut installation time and costs and add strength. Available in any width.

* TRADE MARK



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Fresh, clean air is essential for maximum richness and volume of milk. Proper ventilation helps maintain herd health and adds profitable production years to life span of each cow. Lektrik-Air* ventilation protects the barn itself and all equipment from rot and rust by removing excess moisture from the barn. Efficient Hudson fans move great quantities of air, even against high outside wind pressure.

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Tested and Proved Equipment

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Send FREE Catalog on Barn Equipment.

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LIFE-TIME FENCE

Least Expensive to Establish!
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FORREST KEELING TYPE

MULTIFLORA ROSE

HORSE HIGH — BULL STRONG — GOAT TIGHT

EASILY PLANTED—FAST GROWING . . .
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HOW TO STRETCH PASTURE

(Continued from page 57)

during the season of blue grass growth. This covered from six to seven months of mild or hot weather from spring to fall with a decided slump in mid-summer. They had, in addition, grazed sparingly some of their small grain crops, and fed their cattle corn stalks.

But now they are learning the value of grazing grain crops to the limit of their carrying capacity through the fall, winter and spring. New forage crops are filling the normal gaps that occur in the bluegrass season during the hottest summer weather. Korean lespedeza with a little help from Sudan grass and sweet clover are helping keep the milk flow up during the July and August feed shortages.

The Permanent Pasture

The basis of a good pasture program must be the permanent pasture, and the permanent pasture must be more than an odd shaped, marginal field wrapped with barbed wire.

Some of the world's most fertile soils are found in the Midwest, but these soils are none too good for pasture. Where grass is the main crop on a farm, the grass should grow on good soil. Ravines, hillsides and gullies should be left for trees. Select good level or rolling land and start out by figuring that you must spend money to get your pasture crop much as you spend it to get a good corn crop. And since the pasture program is going to be a major factor in your farm income, start at the bottom with a thorough soil test. The county agricultural agent or the local representative of the Soil Conservation Service will help with this. Soil tests tell the farmer the fertilizer and lime needs of his fields for growing pastures.

The average Midwest field will need about two tons of ground limestone per acre every five or six years. Phosphorus is important, and if the soil tests show a definite lack of this element three to four hundred pounds of 20 per cent super phosphate should be drilled at the time of seeding. Potassium and the trace elements can be safely by-passed unless the soil tests show decided shortages.

If the field is short on nitrogen and organic matter a top dressing of 200 pounds of nitrate of ammonia or its equivalent in some other nitrogen fertilizer will pay. Top dress the nitrogen when the grass is about three or four inches high. This helps the new stand of grass to get ahead of the small weeds that may be coming along. Many farmers figure that if the soil tests reveal no particular shortages in plant food it is still a good policy to add about 300 pounds of 4-12-4 at the time of seeding to insure a quick and proper start in life for the new seeding.

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species. If they are planted too deep they may look on the whole situation as hopeless and not bother to come out of the ground.

They should be planted only a fourth to a half inch deep, or even less if possible. This calls for a well-worked seedbed, leveled and allowed to firm down. If the seedbed is level land the field can be plowed, disked and harrowed in the common fashion. If the field is hilly, however, such a practice might invite erosion, and the pasture experts have long propounded the trash mulch method for keeping erosion in check. The trash mulch system of soil preparation is based on preparing sloping land with disk plows, two way disks, or field cultivators. The aim is to dig up the surface but not turn the organic matter under. When left to litter the surface the old plants form a sponge and help protect the soil from water and wind. The use of a rototiller to prepare a seedbed at one operation and still keep the mulch on top is becoming increasingly popular.

The grass can be seeded by hand seeders or with drills, but special care must be taken to set drills for shallow planting. Once on the ground the seed can be covered sufficiently with a cultipacker, which also serves to firm the seedbed for better germination. Most grasses should be planted from August 20 to September 1 in the southern half of the Midwest and a week to ten days earlier farther north. Spring plantings may serve better in the extreme northern parts of the country.

What to Plant for Permanent Pasture

The permanent pasture should be a combination of grasses and legumes. The legumes help keep the soil fertile and they are both nutritious and tasty to the stock. Much good pasture is bluegrass and white clover. Other possible combinations include bromegrass and ladino clover, or redtop and lespedeza. Orchard grass or tall fescue can also be used in the permanent pasture and although these are rather coarse grasses, they can, when properly cared for and grown in combination with legumes, be highly nutritious forage crops. Tall fescue and bluegrass are better for winter pasture than redtop, which turns brown in cold weather.

The farmer can take his choice of several good combinations of plants for permanent pasture. The following ones are the most common:

1. Brome 7 pounds, alfalfa 10 pounds (good for the northern half of the Midwest).
2. Tall fescue 15 pounds, ladino clover 2 pounds (good for heavy wet land).
3. Orchard grass 15 pounds, alfalfa 8 pounds, can add 10 pounds lespedeza in southern part of the Midwest (good on well drained land).
4. Orchard grass 10 pounds, tall fescue 5 pounds, ladino clover 2 pounds, Korean lespedeza 10 pounds.

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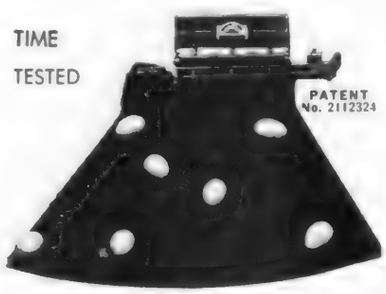

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How To Stretch The Pasture Season

The Missouri plan for all year pasture calls for a definite pasture rotation schedule including six basic points.

1. The farmer who follows the Missouri plan starts his grazing year with approximately 75 days of pasturing permanent pasture from the middle of April to the middle of July.

2. He then switches his stock to his fields of Korean lespedeza for about 90 days, from mid-July to mid-October. The Korean lespedeza can be grazed close to the ground and still reseed itself for a thick new growth the following spring.

3. From the middle of September to the middle of December the stock graze on rye, winter barley, or first year sweet clover. Sweet clover will have little feed value after the first good freeze.

4. From the middle of December to the end of February the permanent pasture comes back into the limelight, for during the winter months the grass left by the fall growth can be pastured whenever the ground is free of snow. The 100 winter days will provide the least pasture of the entire year, but a good stand of grass saved for this time can help out during seasons of high feed prices. During the winter the stock must, of course, be fed supplemental hay.

5. Wheat grown for grain may furnish some pasture as far north as southern Missouri.

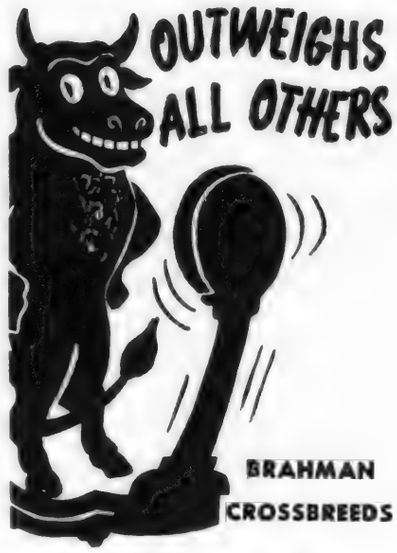
6. From the middle of March until permanent pasture is ready in April the stock may be shifted once more to rye, winter barley, or wheat. If the grain is not to be harvested for a cash crop it may be grazed out completely in May. Grain planted for a cash crop should not be pastured after the middle of April. Heavy pasturing of the grain crop will reduce the yield and the farmer must weigh the value of good pasture against the value of a grain harvest from the same field.

This plan, in an average year, provides pasture for most of the year. The dates are approximate and vary, of course, depending on how far north or south the farmer may operate, or upon the unpredictable vagaries of the seasons themselves.

Summed up, the Missouri system for year 'round pasture calls for (1) permanent pasture in late spring, early summer, and winter; (2) lespedeza pasture in mid-summer and late summer; (3) grain pasture during the entire autumn and early spring.

How To Keep Pasture Working

A permanent pasture should last indefinitely if properly handled. Keeping the pasture producing at a high level calls for returning to the field all the elements taken off by grazing. Cattle return many of these elements in their droppings. The droppings return about 70 per cent of the nitrogen grazed off the field, 63 per cent of the phosphorus, 86 per cent of the potassium, and 65 per cent of the cal-



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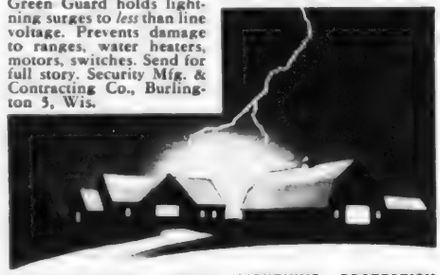

SECURITY LIGHTNING PROTECTION IN THE MODERN MANNER

cium. The remaining 30 per cent of the nitrogen will be returned by legumes providing they constitute at least 20 to 40 per cent of the pasture mixture. Two tons of limestone every five or six years will replace the calcium since it becomes available to the plant over a long period of time. Since cattle retain in their bodies only 14 per cent of the potassium they take from the field a light application every five or six years will return this element. Phosphorus is the elusive element in the plan, and the permanent pasture should get at least 200 pounds of 20 per cent superphosphate every second year. Phosphorus changes to an available form quite rapidly and this fact makes it better to apply the element at shorter intervals than are set up for potassium, or calcium.

Proper grazing rotation is the essence of good pasture management. A good pasture can be ruined in one season by severe overgrazing. Scotch farmers have learned this through centuries of animal husbandry, and today spare no effort to treat both their animals and their pastures properly. One Scotch farmer starts the pasture season in the spring by turning his milk cows out to graze a 10 acre paddock for only 30 minutes after each milking three times a day. This continues for eight days before the cattle are transferred to another paddock and no part of the pasture is overgrazed.

When To Start Over

There are circumstances that can make a permanent pasture non-permanent. There are times when the farmer is wise to rip the field up and start over. For instance the legume content of the mixture may gradually diminish until it falls below the 20 per cent needed to keep the nitrogen fertility up.

It isn't essential to start with the plow in getting this field back into shape. A disc or field cultivator can dig up the field and still leave much of the deep rooted grass in production. Once the field is scratched it should be fertilized in accordance with a new soil test, and then the legumes can be planted and the whole thing given a once over with the cultipacker. Since mixtures are generally better than pastures composed of one or two plants, each renovation can be taken as an opportunity to seed in some additional plants such as perennial rye grass, reed canary grass, or sweet clover. Each renovation, over a period of years, should make the pasture a little more productive than it has been previously.

Costs of establishing new or renovated pastures vary with the plants seeded, the preparation of the land, and the fertilizer needs, but most farmers find that they spend from $25.00 to $50.00 per acre on the job.

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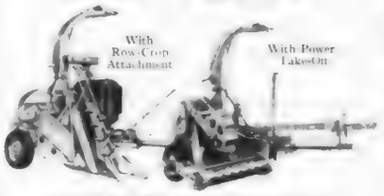

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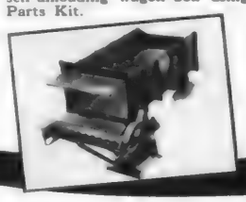

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keeping the green forage cropped off to the surface also keeps the roots small. Eventually the roots will be shallow and the grasses will die during dry seasons. Once or twice a year the grasses should be allowed to reach nearly their full growth, to allow the roots to move down into the subsoil where they tap the stores of minerals. The first big growth of the permanent pasture comes in the spring. This can be cut for hay or grass silage before it gets tough and starts to seed out. The next large growth comes in the autumn while the cattle should be grazing rye or perhaps Sudan grass. This growth can be left for winter pasture, thus extending the pasture season into the cold months.

Carl King, who raises registered Herefords in northern Arkansas, has stretched his pasture season from six to ten months and is figuring out ways now to have pasture during the remaining two months. "We haven't completed our changeover from native to tame pastures," King explains, "and each year, during July or August we break up a portion of the remaining native pasture and seed it to our favorite mixture. Early in September we seed a bushel and a half of oats and vetch for a nurse crop. Then we use the cyclone seeder to put down equal parts of fescue, timothy, orchard grass, and redtop. The legumes are a mixture of white clover, red clover, and lespedeza. After the first year or so the pasture is composed mostly of fescue, orchard grass, white clover and lespedeza."

King spreads 100 pounds to the acre of ammonium nitrate in February to give the pasture mixture a good start, and every other year he adds 200 pounds of superphosphate. "Then by rotating our pasture," he adds, "we get fully ten months of grazing."

Everywhere that livestock provide the mainstay of the farm program the story is the same. Farmers are learning new ways to stretch their pasture for it's the cheapest feed they can produce.

Scientists are still searching for new and better pasture plants. There is no reason to believe that the future won't bring better pasture still, and farmers should soon have pasture fit for grazing whenever snow doesn't cover the fields.

THE AUTHOR: John I. Smith, who writes here of the promise of longer pasture seasons, has spent much of his life as a farmer. Until he was 33 years old he produced cotton and livestock in southern Arkansas not far from his birth place. A herd of cattle helped pay his way through the University of Arkansas from which he graduated in 1923. After earning his master's degree at the University of Wisconsin in 1927 he entered farm credit work, and at present is the farm representative of the First National Bank of Fayetteville, Arkansas.

LEGUMES NEED HELP

(Continued from page 77)

direction of O. N. Allen, a variety of legumes was planted and grown in controlled greenhouse experiments. Different inoculating bacteria were tried on each legume tested in an effort to learn the importance of selecting the right bacteria for each plant. From this research grew the conviction that we need new and better strains of root nodule bacteria for many of our common legumes. This search for better inoculating materials goes on constantly at several of our agricultural colleges and experiment stations.

Different strains of bacteria working on the same legume show varying abilities to fix nitrogen. Some are good at the job, some poor, and others are even parasitic since they form nodules on roots, but fail to fix any nitrogen. These free boarders still draw on the soil for their own needs, and return nothing for the favor.

Following this discovery, plant scientists decided that the number of nodules on a root system is no indication of the nitrogen fixing ability of the bacteria living in those nodules. The actual benefit from the bacteria can only be learned by studying the growth rate, the color and the vigor of the plants, and in some cases the total weight of nitrogen fixed per acre can be determined.

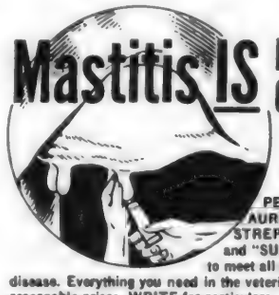
There is some chance that inoculant companies will eventually market specific mixtures suitable for only one or two legumes. This would complicate the farmer's job of selecting his inoculant, but it might prove valuable because of increased yield of the inoculated crop.

Why Inoculate?

Most soils have bacteria in them. If these were the proper bacteria in adequate strength for the legume the farmer wanted to plant, there would be little need for him to inoculate his seed. Such a condition seldom exists, however. Even when planting soybeans on ground that grew soybeans the previous year it is good practice to inoculate, since the bacteria might have lost considerable strength in the meantime.

In other cases the bacteria present might be poor or mediocre for the job at hand, and the farmer saves time and money to supply the proper bacteria with the seed.

The farmer who fails to inoculate



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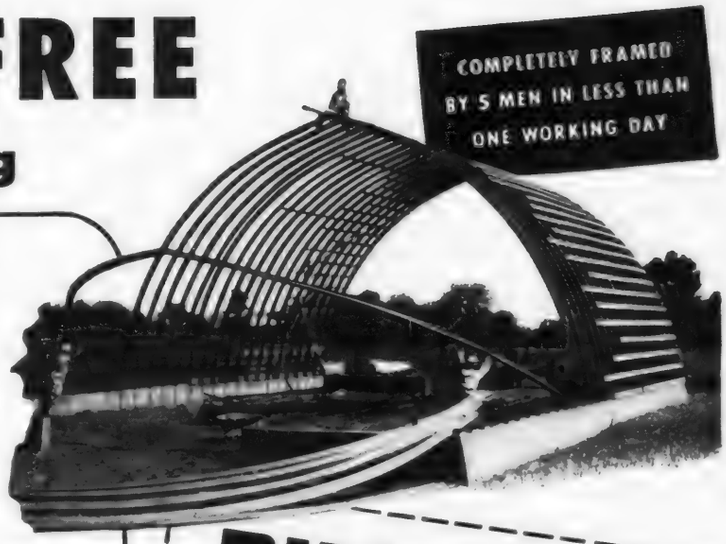

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where he should is not long in discovering his error. When confronted with a nitrogen famine the plants grow yellowish and spindly, and yields are low.

Both from the scientists' research and from the farmers' personal finding have come very definite ideas on when legumes should be inoculated. The best rule is "When in doubt, inoculate." But to help clear up the doubt here are some specific rules.

1. Always inoculate when the legume you're planting hasn't been grown on the same field the previous year. Even though the legume may have been grown on the field before, there is a good chance that the proper bacteria might not be concentrated enough to do a good job of nodule formation.

2. Inoculate if the previous legume crop showed poor root nodulation, for if the proper bacteria weren't present for the first crop they won't likely be waiting in the soil for the second planting. The really hard working nodules are large ones close to the root crown, and they are usually pinkish in color. A root that is widely covered with small white nodules may suffer a nitrogen shortage.

3. Inoculate if planting a widely different legume from the one previously grown on the soil. Bacteria that form nodules on the roots of one legume may be of little benefit to another one.

4. Inoculate if a non-leguminous plant has been grown on the field since it produced the last crop of legumes.

5. Always inoculate legumes which are being planted on poor or run-down soil.

The best rule is to inoculate every legume crop planted. The small cost and simple procedure are easily justified by the insurance offered. The average cost of inoculant for an acre of legume seed is 20 cents.

There is nothing complicated about inoculating legume seed. Pour the seed on a canvas or other clean dry surface and spread the inoculant over it. Mix the two thoroughly with a shovel or the hands; it's that simple, and the procedure is the same for every kind of legume seed.

The most important precaution is to select the proper inoculant before starting the job. At the seed, or supply store, the clerk will sell you the material you ask for. Tell him what specific legume you plan to seed. "One place where farmers run into trouble," says O. N. Allen of the Department of Bacteriology, Wisconsin College of Agriculture, "is when they go to the store and just say, 'I want some clover inoculant,' instead of asking for red clover inoculant if it happens to be red clover they're planting." Once the farmer has the correct inoculant in his hands he should read the directions and from there he can hardly go wrong.

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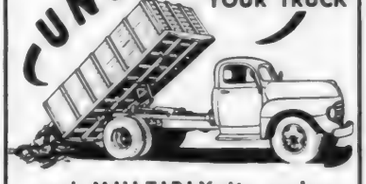

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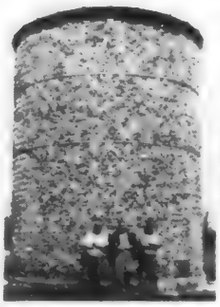

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TON LITTER PRODUCTION

(Continued from page 51)

—rowed but six pigs in her twelfth litter.

Of her 12 litters, nine have qualified for registry. Her ninth qualifying litter consisted of 10 pigs, nine of which were eligible for registration. They were farrowed on Oct. 6, 1949, and at 56 days the litter weighed 396 lbs.

To qualify for PR a sow must raise at least eight pigs to a minimum of 320 lbs. in 56 days and 50 per cent of the litter must be eligible for registration.

Ringold Lady Dora farrowed her first qualifying litter Sept. 6, 1944. In the five years since she has repeated this production performance eight times. She has farrowed 12 litters and 135 pigs and has raised 111 pigs herself. Since her first litter she has farrowed spring and fall litters without interruption and has raised an average of 9.2 pigs per litter, including the three litters which did not qualify. The national average is less than 6.3 pigs.

In 1943 she became the key foundation sow on the Wm. R. Goodheart Farms, Eaton, Ohio. More than 90 per cent of her daughters were retained in the farm herd. She was sold to the Meadowlark Farms in 1948 after her seventh PR litter was qualified. Claude Sisson has been her herdsman through her last five farrowings. He feeds her corn, oats, pelletized dairy products, alfalfa pasture or alfalfa meal before each farrowing. Her litters have been creep fed early and raised on a ration of 7 parts corn and 3 parts oats, with dairy pellets.

Her first three PR litters were sired by Eaton Roller Knock, her eighth by Topmost, her fourth, fifth, six, and seventh by Fashion King G 1 Star PR 38; and her ninth by Con Carnie.

Another sow of more than local fame is HR Lou 7, a Yorkshire, whose 19 pigs set a world's record weaning weight of 761 lbs. last year. Her owner, Harold M. Morris, DeWitt County, Ill., had to separate the litter and ran two shifts at dinner time since Lou had but twelve dinner plates.

Her second world's record was set when she weaned 48 pigs in one year. She followed up the 19 pig litter (farrowed early in 1949) with another that fall of 15 pigs. Early this year she weaned a third litter of 14 ten days short of a full year.

The 19 pig litter set another record last fall for pork raised from one litter; at six months they tipped the scales at 4,046 lbs., doubling the ton-litter class with 46 lbs. to spare.

THE AUTHOR: Arthur Edwards was born and raised on a Missouri livestock farm near Bunceton, and was graduated in 1947 from the University of Missouri with a degree in agricultural journalism. He was assistant extension editor for the University of Missouri until 1949 when he resigned to join staff of Rural Electric Missourian, state REA paper, and is presently serving in that capacity. He served in U. S. Army almost three years during the late war, mostly in European theatre with 26st Infantry Division. Received purple heart on three occasions and other awards. He has done considerable agricultural free-lance writing for major agricultural publications. He is 27 years old; married and has three sons—ages, 3, 2, and 4 months.

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HOW TO MAKE BUTTER

(Continued from page 78)

piped through a milk trough. If spring water was not available some farmers ran a pipe from their pump to an animal watering tank through the trough. The second way to separate the cream is by a separator. In either case, cool the cream at once after separation. The temperature should be 50° or slightly lower. Stir occasionally to hasten cooling. Mrs. Keeting advises never to mix fresh, warm cream with older cream until the fresh cream is cool.

A possible third method of separating cream is to add water to the milk. This does bring the cream to the top quicker, but the butter made therefrom has a washed-out, flat flavor. It is not recommended.

Fresh, sweet cream usually makes the best butter although butter made from sour cream is preferred by some. The sour cream should be clean flavored. Any touch of rancidity will affect the butter. There are also other objectionable flavors in cream which sours under average farm conditions. Bacteria, other than those which cause the cream to sour, produce the bad flavors.

If you like butter made from sour cream, and you have sweet cream which you wish to "ripen", the process looks simple, but it is not. You simply heat it to between 70 and 75 and let it stand until it is ripened, or soured. Then cool and churn. If the temperature rises beyond 75, other bacteria than the souring bacteria will grow and produce objectionable flavors. If the temperature is lower than 70, the butter will have a bitter, stale flavor. This is a delicate operation and the novice should stick to sweet cream butter until she has earned her badge.

Some of the worst butter made comes from farms where cream is saved from day to day for a week or longer. The batch of cream is a mixture of skimmings in all degrees of sourness plus a generous dose of other flavors produced by bacteria which have grown in the high temperatures usually found when artificial refrigeration is lacking. If coarse cow salt is used, and improperly mixed in the butter, the end product is enough to discourage the most enthusiastic butter eater.

Although it is not necessary, if you wish the butter to keep well, or if you suspect that there may be disease-producing bacteria in the milk, the cream should be pasteurized. Pasteurization is simple; place the container of cream in a larger kettle partly filled with water, heat to 150 degrees for 30 minutes, stirring often, then cool quickly to 50° or slightly below. Cream should not be churned immediately after pasteurization, but should be left to stand overnight.

Now that the cream has been prepared, job number two is to churn it. Churns come in a wide variety of shapes, sizes, and colors, but they all have one feature

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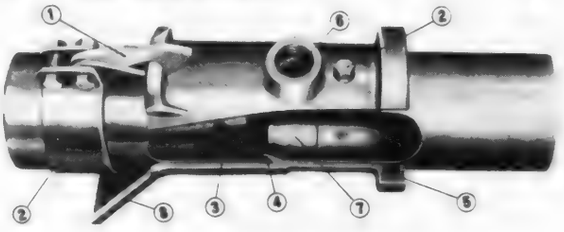

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churn with revolving paddles. If you have a small amount of cream you can buy a glass churn in which the paddle is turned by a set of gears and a manually-operated crank. These vary in size from a quart to two gallons. Mrs. Keeting uses a dasher churn and prefers it to other types. She admits this may be a simple prejudice. Whatever type of churn you use, scald the paddles and the inside of the churn with hot, soapy water, then rinse well with cold water. Never pour cream into a hot churn.

Pour the cream into the churn through a strainer. Do not fill it more than one-third full. If the churn is too full, churning time will take longer in proportion to the amount of cream. Color, if needed, should be added at this time. About 30 drops per gallon of cream is enough. Ordinarily, butter needs no color when the cows are on good grass. The coloring, Mrs. Keeting assures us, doesn't affect the flavor of the butter nor its other qualities. It just looks more like butter, which may range in color from a flat white to a very warm yellow, depending upon the type of feed the cows get.

The churning temperature of the cream should vary from 48° in spring and summer when the cows are on pasture to about 60° in fall and winter when the cows are on dry feed. When cream is at a temperature of 100°F the globules of fat are in a liquid condition. As the cream is cooled, the butterfat solidifies slowly, beginning at 75°. Even at 48° or 50° solidification is not sufficient for proper churning until the cream has stood at that temperature for at least two hours. If it is churned before standing the butter collects in a greasy, soft mass on top of the buttermilk. The buttermilk, in this case, contains fully ten per cent of your butter which won't separate.

Be careful that the cream does not warm up during the churning operation. In the summer Mrs. Keeting does her churning in the cellar where it is damp and cool.

The best results are obtained with cream testing not more than 30 per cent butterfat. If the per cent of butterfat is higher than 30, it may stick to the sides of the churn and cause difficulty churning, especially if it is sour. Cream produced for sale to a creamery is usually about 35 per cent butterfat. This should be diluted with milk if churned at home. If the cream has been skimmed by hand, which is the method Mrs. Keeting uses, the percentage of butterfat will be lower, probably around 25 per cent, and churning time may take a little longer, but the results will be just as good.

Don't be alarmed if a lot of froth and foam forms during the first part of the churning operation. This will gradually subside. However, if you get whipped cream instead of butter, look to the temperature. If this is right, keep on and butter will eventually crown your efforts.

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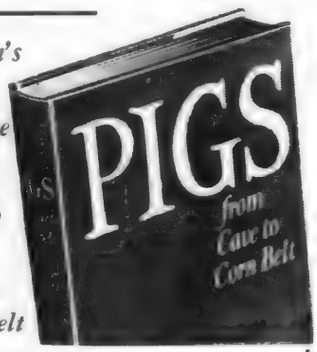

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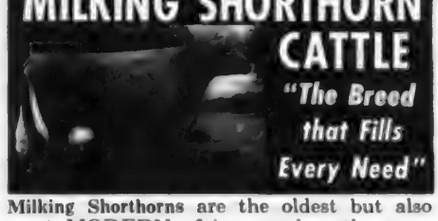

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The physics of churning are simple: the impact of the paddle or dasher bursts the minute globules of butterfat which are floating in the liquid. Gradually these minute particles cling together, getting larger and larger as the churning progresses, until they are the size of a pea. Churning is now finished and from here on the gathering of the particles is done with a wooden paddle in the hand. If churning is continued until the butter is in larger masses, the buttermilk gradually works back into the fat and is difficult to wash out. Churning should not take longer than 45 minutes. If everything is just right the job can be done in 20 minutes. Mrs. Keeting guesses that it takes her 30 minutes in summer, 40 in winter. If this variation is too great, the cream is too warm or too cold, the churn is too full, or your cow is near the end of her lactation.

Now that the buttermilk and the butter have been separated, work carefully, for this is a critical point in butter making. Carelessness in washing and working butter may ruin it. In washing use clean, pure water about the same temperature as the buttermilk, *and in equal amount*. If the granules are soft the water can be a few degrees cooler. After the buttermilk is thoroughly drained off, dash one or two dippers of water over the granules and allow to drain. Then add the balance of the water and let stand for ten minutes. Then drain this off. If a barrel churn is used, give it a short spin before draining.

Now lift the butter out of the churn, using a wooden paddle. Place in a wooden bowl and sprinkle salt over it, one-half ounce to the pound. If you haven't a scale, salt to taste. Work the butter with the paddle, folding it over itself, using short, choppy strokes. Sliding the paddle over the butter packs the granules too tight and the butter gets "greasy." Good butter should have a tough, waxy texture, not slick. It should have some imprisoned air. It stands up better in warm weather if it contains a minimum of water, Mrs. Keeting believes.

As the butter is worked, the moisture, a mixture of buttermilk and water, will collect in the bottom of the bowl. Pour this off from time to time.

Work until the salt is well mixed and most of the moisture has been eliminated. The "drier" the butter the tougher it is and the longer it will keep.

If you like sweet butter, don't add salt. Sweet butter should be kept in the refrigerator, for it soon grows rancid under room temperatures.

Sweet cream butter will keep for months at low temperatures if the cream was pasteurized. The best place to store butter is in a deep freeze or refrigerator where the temperatures are at least 10°F or lower. Sub-zero won't harm the flavor. If these temperatures are not available, wrap the butter in waxed paper, make a solution of one third salt and two thirds water, immerse the butter, weight it down, and it will keep handsomely for six months. Keep

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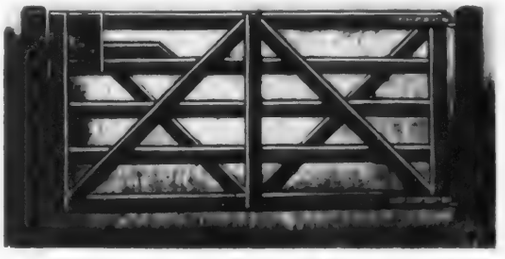

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This fence will not spread . . . Will provide windbreak, bird shelter and food.

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Growing Multiflora for 30 years

the temperature between 56° and 76°. Sour cream butter will not keep well in storage.

Butter Facts

A gallon of cream testing 33 per cent should yield three pounds of butter. When the butterfat test and weight of cream are known, the butter yield should be 1.2 times the pounds of fat. For example, 20 pounds of 33 per cent cream contain 6.6 pounds of fat and should yield 6.6 times 1.2, or 7.92 pounds of butter.

Overloading the churn, employing too low temperatures, churning cream that is too fresh, churning cream that is too thin or churning cream from cows well advanced in the lactation period causes butter to churn slowly. Adding hot water to the cream in small amounts sometimes aids in churning cream that churns slowly for one of the above reasons.

Good commercial butter contains about 85 per cent of butterfat, some salt, a little curd, and the remainder is water, about 10 per cent. However, the Food and Drug Administration demands the presence of only 80 per cent of butterfat and quite generally that is all there is.

A few buttermakers slyly put in just a little less than the required 80 per cent, hoping to escape detection. If they get away with it they can make considerable money that way, especially if they produce butter by the carload. Even if they are detected they make money after paying their fine because a very small lowering of the butterfat content is profitable in carload lots. Water is so much cheaper than butterfat.

Butter is by nature very easily contaminated by micro-organisms and otherwise. It is not supposed to contain any parts or residues of insects, rodents, or cats. But very often it does and these can be detected only with a microscope. They usually are detected: the courts generally consider this a very raw deal on the public, and the penalties are heavy.

Butter Grades and Testing

Butter comes in U. S. Grades—AA, A, B, C, and CG or cooking grade. Good butter tastes good. But who judges that and how?

Despite all the methods and apparatus of science the expert butter grader finds himself engaged primarily in an art. It is easy enough to determine the quantity of water and butterfat present and to detect gross adulteration by laboratory means. But it is taste that counts in butter and most of its taste is smell.

Therefore the butter grader falls back on organoleptic tests. He uses his well-known five senses and tastes, smells, looks at, feels, and listens to the butter. Flavor and its intensity count most of all. Here the grader must concentrate his very best efforts to detect the flavor or mixture of flavors correctly.

He begins with smell. He pulls a plug of butter out on his trier and observes its

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IRVINGTON, N. Y. DES PLAINES, ILL.

aroma for the full length. That enables him to judge the butter from the very top to the very bottom layer of the container. There must be no distraction at this point, no confusion, even no noise, no perfume or lotion.

When the expert, unperfumed grader has sniffed the aroma of the butter in his comfortable well-lighted room he can pretty well tell then and there whether the product is good. He also knows the quality of the raw materials which went into it. The careless creameryman may think he can dash in a spot of stale cream but the good grader unerringly detects that. The poorer flavors, which are harsh, crowd out the finer, more delicate ones.

Next the grader places a bit of the butter in his mouth. Then he notes not only the taste but how the butter melts. By taste he checks his previous opinion based on aroma. But touch also comes in here because he observes how the butter feels in his mouth.

The way in which the trier originally went into the tub of butter told him something about its firmness and stickiness. Now, as the sample melts in his mouth, he notes whether the butter feels smooth, firm, and waxy, or weak, mealy, and seeded with gritty salt.

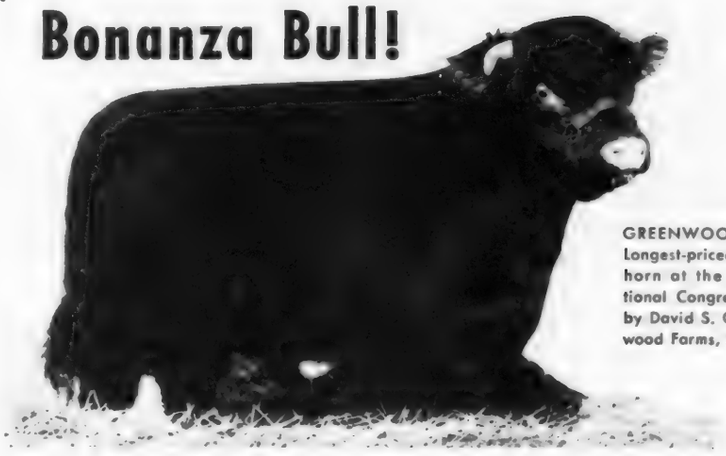
Naturally he looks at the butter. He thus tells whether it is light or dark, bright or dull, uniform or mottled. The presence and size of the water droplets becomes apparent. A bright or dull appearance tells him about the grain of the butter granules.

Finally the grader listens to the butter. When he replaces a plug of quite leaky butter into the original hole free water there may give a swishing sound. That is final evidence that the grade must be lowered for leakiness.

The final grade of butter is based on its flavor and its defects as to body, color, and salt. A dash of stale cream in the original vat will lower the grade of the final product as quickly as anything. A delicate and accurate test has recently been developed by the U. S. Bureau of Dairy Industry which will unerringly detect additions of improperly pasteurized cream or milk somewhere along the line.

All this the unperfumed man finds out in his comfortable room. He's an expert. But Mrs. Keeting's husband and her two husky sons are experts too. They know good butter because they've been raised on it. Clancy, the youngest, who is now 28, still believes that the acme of all good things to eat is a slice of his mother's warm home-made bread, spread with a good quarter-inch of butter and topped with as much fresh strawberry jam as will stay on the slice comfortably. There's scarcely a vittle in the cookbook that butter won't improve. Good butter makes them superb.

Bonanza Bull!



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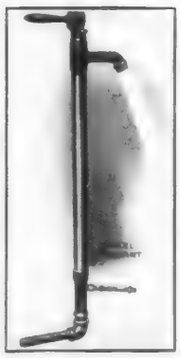

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THE RISE OF THE SOYBEAN

(Continued from page 33)

The Oklahoma Experiment Station has been looking into this possibility in its experimental plots. They point out that the edible beans mature earlier than the field varieties, usually in the middle of the summer. They should be cultivated like garden peas or beans, tilled and weeded often for best results. They outrank table beans in protein content and the protein is more easily digested. They also contain about 12 times as much fat as ordinary beans. The large scale cultivation of edible soybeans is still a future possibility, but to date such cultivation has proved unprofitable.

Is the Soybean a Robber?

And as farmers continue to raise their profitable crops of soybeans year after year, they still argue among themselves about whether or not the crop is bad for the land. They point out rightfully that it uses considerable phosphorus and potassium. They have also damned it as a soil eroder, and with some reason. The plant loosens the top soil, breaks it down and leaves it open to the ravages of water and wind.

Recent tests by Professor G. M. Browning of Iowa State College have pointed out methods farmers can employ to reduce erosion caused by soybeans. The farmer who plants beans up and down his slopes can cut the soil losses in half by contour planting. After the combine reaps the harvest, the plant residue should be left on the ground. It is usually of more value there than it is in the barn as feed. It protects the soil from the beating action of raindrops, prevents crusting of top soil, and allows water to sink into the soil. Burning the residue, say the Iowa experts, is a first-rate mistake, because it both destroys organic matter and leaves the surface barren.

Few plants have had the benefit of such intensive scientific research as the soybean. The USDA has experimented with it since 1900, and the state colleges, growers, and private industry have helped it in its climb.

In 1936 the USDA and twelve Midwestern soybean growing states began pooling their knowledge at the newly established U. S. Regional Soybean Laboratory, at Urbana, Illinois. The principal aim of the laboratory has been the development of new improved varieties. This approach looks good to farmers who want top yields of high quality beans.

The Lincoln, a variety developed at Urbana, may be the future ruler of the soybean roost, according to Dr. J. L. Cartter, Director of the Laboratory. Lincoln is hardy, resistant to disease, high in oil content, and adapted to a wide area. In test plots and on the farm it has yielded up to five bushels per acre more than Dunfield or Illini, two of its closest competitors for top honors.

In 1942 Congress moved the chemical and engineering sections of the Regional Soybean Lab to Peoria, Illinois, where

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The LEGUME-AID package is appreciably larger than others in size and contains more of the bacteria-carrying humus. This extra amount of inoculant makes it easier to treat your seeds more thoroughly at planting time.

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The Northern Regional Research Lab, an enlarged industrial laboratory, was established. The Peoria Laboratory is searching for new uses for soybeans. They're investigating such outlets as paper coatings, drying oils for paint, plastics, synthetic rubber, glues, and human food products.

Dr. Reid T. Milner, Director of the Laboratory, feels that recent discoveries made at Peoria will eventually increase the demand for soybeans. One is dimer acid, which is used in making high quality drying oils, thickening agents for gasoline, and a synthetic rubber.

The other is Gelsoy, a product that represents, so far as is known, the first gelatin-like product ever made from vegetable protein. This edible protein dissolves in water and looks and tastes like egg white, but costs far less than egg white. The discovery of Gelsoy is one of those happy accidents which sometimes bring scientists sudden and unexpected success. A laboratory technician was warming a water extract of soybean flakes which had previously been washed with alcohol. The warming was to cause the water solution from the flakes to "whip" or foam faster when stirred in a kitchen mixer. The preparation was for demonstrating the whipping qualities of the solution to a visiting industrialist. But the visitor was delayed a half hour, and the technician put the material back on the stove to keep it warm.

When the belated visitor arrived, the technician started to demonstrate the whipping, but found the material had become solid, like cold gelatin. Suddenly, as she stood looking at the mixture, she realized that although her demonstration was ruined, she had discovered something that had stumped her supervisors in the laboratory, and many other persons throughout the world, for years. She had found how to prepare a vegetable protein derivative in a solid form. Now there is great promise for Gelsoy in the food industries because it is an inexpensive material that will whip and take coloring and flavoring. With slight alterations, it can also be used for adhesives, having the peculiar characteristic of being "non-reversible" which means anything once "stuck" with Gelsoy cannot be steamed open. Moreover, it will make paper stick to metal, permitting more secure labeling of canned goods.

The soybean is no longer a curiosity. It has come up through the ranks on its own merits, and its merits promise to make it still more famous. It can now be turned into food and paint, plastics and feed. As new uses are found for it, the farmer will find the market for soybeans steadily dependable; he will have a big job just keeping the supply adequate for the demand.

THE AUTHOR: David A. Heller is on the editorial staff of the *Washington Post*. He spent his boyhood in Centralia, Ill., which he describes as "the heart of soybean district," where he watched the soybean during much of its climb to fame. He is a graduate of the University of Chicago, where he also took a law degree. After a brief career as a clerk in a law firm he entered journalism and now, in addition to his newspaper assignments, writes for a variety of national magazines. He is a neighbor and personal friend of Dr. Morse, the "Father of the Soybean" who helped him extensively with this, his first Farm Quarterly article.

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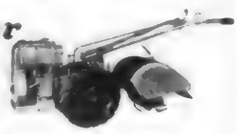

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BEEF BULL TESTING

(Continued from page 41)

selection for both rate of gain and conformation characteristics may be carried on simultaneously, with maximum results from such selection.

Next came an attempt to determine the effect of heredity on both rate and efficiency of gain. Here the researchers really began to hit pay dirt. It was found that when all the animals on test were fed the same amount of feed for the same number of days there was a close correlation between rate and efficiency of gain. Also, an analysis of feeding results indicated that the feeding of six to eight steers from any one bull during one test period would give a fairly accurate index of the inherited growth ability of a sire as measured by his offspring. Year after year, it was found that the same sire repeated his performance from one group of steers to another.

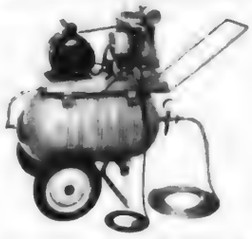
Since it became apparent shortly after starting the testing program that heredity played a large part in determining the rate of gain of the various steer groups, the testers hit on the idea of testing the sire himself.

In actual practice, here is how the selection of bulls is carried out. The breeding herds, all of which are Herefords, roam the 56,000 acres of the Station along the Yellowstone River. The calves are dropped on the range in March, April and May. Not all of the cattle are purebred, of course, so only about 125 of the bull calves are eligible for registry in an average year. From these 125, 40 to 50 are selected in September for registration on the basis of size, weight for age, conformation, color markings, and general promise of making good bulls. The remainder of the bull calves are castrated at that time. All the calves continue to run with their dams until weaning time, the latter part of October. Then the 40 to 50 bull calves are again carefully inspected with an eye to culling and a few more may or may not be castrated.

After this the bull calves are placed on feed for a period of 196 days, at the end of which time they weigh from 800 to 1100 pounds. The 12 to 15 highest gaining and heaviest bulls are selected and again sorted for conformation points. The bulls finally selected are bred as yearlings to random selected cow herds or test herds for the progeny test. A year later, the calves from these bulls are fed out on a progeny test basis for 252 days and the bulls that sired the best gaining, heaviest, most profitable steers remain on the Station and go into the purebred herds to produce the next generation.

Proof of the value of this program lies in the results achieved. From 1936 to 1940, daily gains ranged from 1.75 to 2.00 pounds while the animals were on feed. Sires that produced the heavier calves were selected to carry on the breeding programs. Since 1940, the steer progeny have been gaining at the rate of 2.00 to 2.40 pounds per day.

CAMPBELL-HAUSFELD "Tankmobile"



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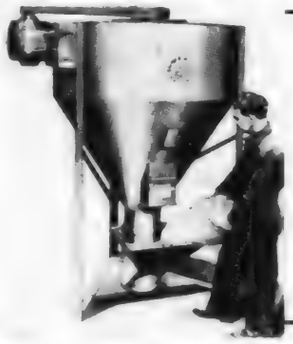

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No breeder of commercial cattle can afford to ignore the variations found between the progeny of different bulls. Table 1 presents the average results of a test conducted from October, 1948 to July, 1949 with eight steers from each of 13 different Hereford bulls. This was a typical test, the variations being not at all exceptional. But there was a difference of 101 pounds between the progeny of sire 173 and sire 188 and a 211 pound spread between their steer groups at the end of the feeding period. Translating this to a dollar and cent basis, there was a difference of $45 per head net returns above feed costs between the best and poorest bulls, meaning in the aggregate that the best bull returned $360 more than the poorest for the eight steers fed.

TABLE 1. Results of Record of Performance Feeding of Eight Steers from each of 13 Hereford Bulls at Miles City, Montana, in 1948-1949.

Sire No.	Birth Weight	Weaning Weight	Final Weight	Daily Gain	Return above Feed Costs
166	83	401	934	2.12	$113
167	82	394	940	2.17	116
168	81	433	1004	2.27	123
169	79	399	965	2.25	126
170	82	397	966	2.26	121
171	73	374	893	2.06	112
173	81	493	1079	2.32	148
174	82	460	1040	2.30	136
177	92	464	1054	2.34	137
178	81	422	981	2.22	126
182	84	418	998	2.30	126
189	80	438	959	2.07	116
188	83	392	868	1.89	103

For the commercial producer, bulls number 173, 174, and 177 are the kind of bulls that will make the greatest profit. Compared with bulls number 166, 167, 189 and 188, the three better bulls returned $28 per calf more than the poorer bulls, or a difference of $224 per bull for the eight steers. Such differences are economically significant.

Cattlemen have often stated that there is more variation between calves from the same sire than between calves from different sires. However, comparisons of the variations between sire groups and the variations between calves from individual sires made at the Station have proved this assumption false. Based on the records of 830 steer offsprings from 110 Hereford bulls it has been found that 86 per cent of the variation in weight at 15 months was due to heritable influences when the animals were given all the feed they could consume. What this means to the cornbelt feeder is that approximately 86 per cent of the variation he observes between his steers is due to their heredity.

To the practical breeder it means that he can accurately estimate the amount of improvement he can expect by selection for weight at a given age. Here's how he can figure. Let's assume he needs a new bull for his herd. He has narrowed his selection to two individuals. They are

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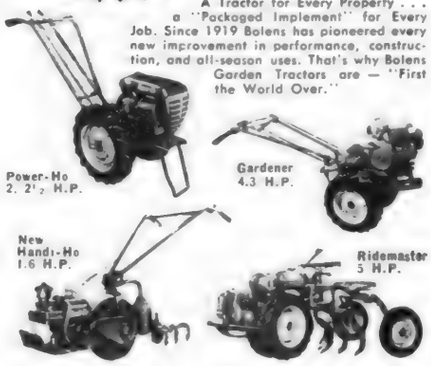

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both the same age but one weighs 1200 pounds, whereas the other weighs 1100 pounds, a difference of 100 pounds live weight. Both bulls were fed alike and had equal opportunity to develop. Remembering that half of the heredity comes from the sire and half from the dam and based upon the above heritability estimate of 86 per cent, the 1200 pound bull's calves can be expected to weigh 43 pounds more than the offspring of the 1100 pound bull when the calves reach the age their sires were at time of purchase. This figure is reached by taking one-half of 86 per cent of the 100 pound difference between the sires, as only half of the heredity comes from the sire, and, of course, assuming that the cows to which the bulls are bred are of equal producing ability. In actual practice that is what has happened at the Miles City Station, with the result that the cattle are heavier today than they were ten years ago when the selection process was in its infancy.

Birth weight has been found to be 53 per cent heritable, with the lowest point for heritability of weight being at weaning time. Weaning weight, being highly influenced by the milk production and mothering ability of the cow, is only 28 per cent heritable.

Quality scores and grades are less influenced by heredity than is growth, but the influence of the parents is still great enough to be significant. Slaughter steer grade seems to be about 45 per cent heritable, carcass grade 33 per cent. Area of eye muscle (the large muscle in the prime rib roast) was found to be 68 per cent heritable, apparently indicating that the amount of muscling of the animal is another inherited characteristic. Inherited differences have also been found to exist in the percentage of edible meat in the carcass, percentage of fat and other points that would seem to suggest the possibility of improving the eating qualities of meat through the use of genetic principles.

Charles Haigler and son, the Ohio Hereford breeders, who have been progeny testing for some time on their own have been successfully applying the results of their tests to the pricing and selling of their bulls. "We are in the Hereford business to produce beef," says the senior member of the Haigler partnership, "and we intend to use and sell only bulls that will do just that. I'll show you what I mean. See that cow out there. Pretty good type, isn't she? But she has never produced a fast gaining calf. Now hop in the truck and we'll drive through this pasture and try to find one of my best beef makers."

The ride soon ends and with an introduction to a white-faced matron wading in a lush pool of brome and alfalfa. She's not a show type, but she isn't common, either. Probably her most apparent deviation from standard would be her somewhat longer back and loin.

"There she stands" says Haigler. "Four

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nineteen has dropped four calves in as many years and they've all made top scores in our tests."

The Haigler's have capitalized on their rate-of-growth testing by showing prospective buyers the growth records of the bulls they have for sale and pricing them accordingly. These records show the weight at birth and at weaning and the weight and daily average gain every 30 days after weaning for a feeding period of 155 days.

Getting back to the experiment stations, Texas and California are among the score or so that have been working on this problem and have turned up with significant results.

The Balmorhea Station in Texas has been working on progeny testing since 1942. Under the supervision of John J. Bayles, they also have worked primarily with Herefords, though a few Angus, Shorthorn, Brahman, Santa Gertrudis and Beefmaster have been used. After having seen more than 1000 head of cattle through the tests, their results have been right in line with the Miles City findings.

Proceeding on the theory that "type, conformation and pedigree are not a complete enough yardstick to measure the worth of beef cattle," the California Experiment Station has set up a progeny testing program, the results of which substantiate earlier and similar tests.

The California workers raise an important question. "How far can we go in the direction of efficiency in growth and fattening and still sire cows that will be good commercial producers?" they ask. "In part, are we dealing with low rate of thyroid activity which is incompatible with good milk production?"

Interesting in this connection, too, are the results of a performance feeding test run at Beltsville with the produce of Milking Shorthorn cows a few years ago. Here it was found that "the trend has been for the higher yielding cows to produce lower grading steers." In other words, some experts think it possible that in producing the perfect beef animal we shall eventually come up with the milkless cow!

Whatever the future may hold in this regard, all the work in progeny testing of beef bulls shows conclusively that the ability to make rapid and efficient gains bears no relation to conformation and is highly heritable, and that an early and reliable indication of a young bull's ability to produce fast gaining, thrifty calves is his own record in the feed lot.

THE AUTHOR: When Bradford Knapp Jr. writes about the record of performance work being done with beef cattle, he is summarizing work that has taken up most of his time since 1931. Born in Clarion, Iowa, he has degrees from Oklahoma A. & M. and Iowa State College. His university work in animal husbandry and genetics was the beginning of his life-long interest in these subjects. At the present time he is in charge of Beef Cattle Breeding Research at the U. S. Range Livestock Experiment Station, Miles City, Montana, where he conducts the research about which he writes.

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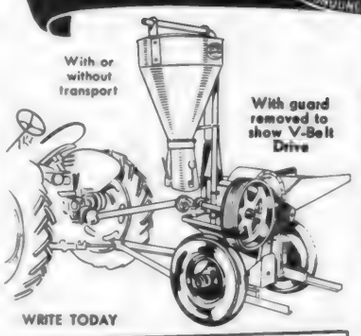

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HOW TO BUY A HEIFER

(Continued from page 87)

even though his oldest boy was big enough to help out with the milking. Since he wasn't expanding I knew that I wouldn't be offered his culls and since Nofzinger knew that he was a member of an artificial insemination co-op we knew that his animals would be well bred.

"Heizingah was cultivating corn when we drove up, but he took time off to take us down to the pasture to look at the heifers, and then drove the two oldest up to the barn for us. They were big growthy animals which is what we are looking for. On the way to the barn I found that the heifers had been vaccinated for bangs disease at four months, but that they hadn't been tested for bangs or TB within the month. At the barn we put them in stanchions and I checked them to make sure they were with calf and checked to see that their teats were open.

"I looked into their mouths. I said I was looking at their teeth to check their age, but I really wanted to see if they had had their tongues cut or ringed to break them from self sucking. Heizingah showed me the milking records on the dam and the slips from the artificial insemination co-op which gave the sire of the heifer and the bull to which she was bred.

"You may think I check too closely," Brown said, "but in this game you have to. There are too many chances of being fooled. The other day I looked at a heifer that was already in the barn. She handled well and looked all right, but somehow I became suspicious. I asked the man to turn her out of the stanchion. He argued a bit, but finally turned her out and she walked right into a door. 'This heifer is blind!' I said. 'Well, she may be a little blind,' he told me, 'but then they don't use their eyes so much any more. They stay in the barn most of the time and almost every barn has a radio these days so they don't need to look around to amuse themselves.'

"To get back to Heizingah; his heifers looked good to me and we agreed on a price. I bought them subject to their passing a negative bangs test. That's the way we buy heifers," Larry Brown concluded, " and any farmer can do the same if he wants to go to the trouble of finding herds where they are not selling culls and checking the individual animals and keeping his eyes open for tricks. Naturally, we feel that buying cattle is a special business and that it would pay farmers to buy through reliable dealers."

"The men that sell animals seem to know more tricks than Houdini," says L. L. Brown, enlarging on his son's remark. "Only the other day we bought a cow that was brought in here. She looked like a good animal even though she was covered with mud. When the men were brushing her they noticed an odd bump on her tail.

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We examined her more closely and found that it was friction tape. We took the tape off and discovered that her tail was wired on."

"Another trick is to disguise a light quarter by not milking that quarter the day before the animal is shown. Her udder will look level and can be milked out without showing the light quarter. There are dozens of other tricks that we have run into and probably dozens more we haven't seen yet. The point is that these tricks most often go with mature cows rather than with heifers. We feel that buying heifers from a good farm with a good herd, where they have been fed well and where the farmer isn't holding back his best animals, the buyer is taking no more risk than the farmer who raises his own."

In a field that is so filled with trickery there are few trade secrets that Brown or any other reliable dealer has from a business point of view. True, he would not willingly reveal the names of his spotters for they are his eyes and ears and a most important cog in his business, but he will be perfectly candid in telling you how prices are set. During all times, of course, the price of beef creates a floor or support price for dairy heifers. With beef high, as it has been during recent years, the beef price has been controlling during flush seasons of milk. During such periods, the price formula would be: the beef price, plus an extra fee for potential productive ability. During other seasons of the year the old law of supply and demand (which has never been repealed) determines the price of the dairy heifer. The beef price and the supply and demand will set the background for each sale, but individual size, quality, flesh, conformation, and stage of pregnancy will be the individual factors that set the price.

"Once the animal is bought," Larry Brown says, "the buyer starts running into additional expenses. First there are trucking charges to transport the animal to an assembly point and then to take all the animals in the area to Cincinnati, then we have a commission to pay to the spotter, our own personal expense on a buying trip, and a veterinary fee for the TB test and for drawing the blood samples which are analyzed by the State Laboratory for Bangs. Naturally these expenses will vary according to the distance the animals must be shipped and the number we are able to pick up on a single trip, but the expense up to the time we get them to Cincinnati, will run from $12 to $25 a head, which is lower than a private buyer could manage. When we sell the animal, we try to realize a $10 net profit on each head and depend on a large volume business to keep us going."

These price factors work well when grade cattle are being bought, but when registered animals are being bought and sold the intangible value of a pedigree enters the picture and must be added to the cost of the heifer.

John Watlington, the dairyman, who has bought both heifers and mature cows, sums up his experiences, "Not all of the heifers have been good producers: but as a whole, they have been satisfactory. Many of these Holstein heifers have milked above 50 pounds per day and as they become mature cows they have milked 60 or more pounds. When cattle are needed, I consider the heavy, springing heifer as the best buy; then, at the earliest possible moment, every dairyman should institute a good breeding program and raise his own replacements."

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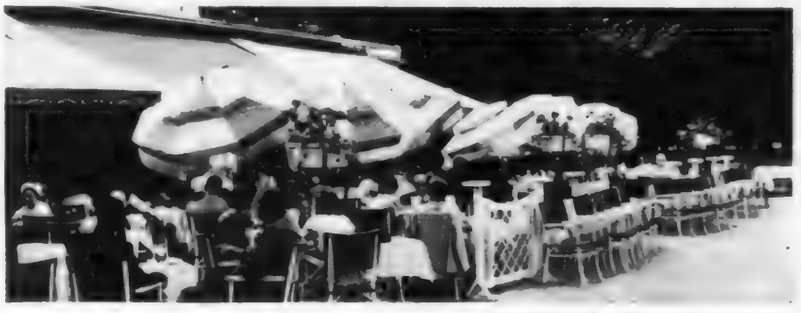

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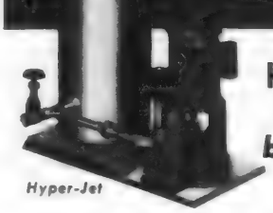

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MOUSETOWN

(Continued from page 35)

While mice are the farmers' competitors they are the mainstay of the fur trade, for in the north the furbearers live largely on mouse meat. Milady's furs, if they are not beaver, muskrat or lamb, are most likely converted mice. Hudson's Bay Company's records show a four year cycle in fox, lynx, mink and weasel pelts with the peak a year after an abundance of mice in Labrador, Ungava and the Arctic. During the years of abundance, foxes won't bother with baited traps. The next year when mice decline, the furbearers which have become plentiful, are hungry and the trappers thrive. The years after that, the mouse supply becomes desperately short and famine reduces the carnivores. Then trapper, trader, and Indian have a bad year.

As Walt Whitman said, "A mouse is a miracle enough to stagger sextillions of infidels," and the mystery of mouse cycles has still not been satisfactorily explained. The cycles tend to run in terms of 11 years with sub-cycles of three and a half years. The cycles end in epidemics of mouse diseases spread by overcrowding. When food and weather are favorable most of the young grow up; when disease is rampant only the disease resistant survive.

No scientist has been able to find any social organization or division of labor in the mouse world. Although they live crowded lives, each mouse looks out for himself. There is no family unit save for the brief nest period. Fatherhood is but a brief rendezvous.

We Turn Our Back

In the war to control the raids of mice, man has as usual turned his back on his best allies; his ever-ready shotgun is the mouse's best friend. The mouse's predators include: wolves, lynxes, foxes, badgers, raccoons, possums, skunks, weasels, mink and shrews, dogs and cats, hawks, owls, buzzards, shrikes, cuckoos, crows, herons, bitterns, storks, ibises, gulls and snakes; quite a formidable list. Of these the most effective seem to be weasels, foxes, skunks, hawks and owls, with the weasel at the head of the list. They seem to kill mice for the sheer love of killing and will often leave far more corpses than they can eat. Every weasel probably kills several hundred mice per year. An occasional pullet as a sacrificial offering is a cheap price for such invaluable assistance.

Means of controlling mice have varied from sacrifices to Apollo of the ancients, to the employment by France of Louis Pasteur. Pasteur developed the fiirst biological warfare by introducing bacterial cultures of diseases into mouse communities. A special type of mouse typhus has since been used in France, but with varying degrees of success.

Without aiming to, farmers kill thousands of mice each year by plowing and

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cultivating, and clean tillage and frequent plowing are often suggested as mouse control methods. Other means of keeping mice under control include the encouragement of such predators as hawks and owls, weasels, and harmless snakes, flooding of lowlands, spreading of poisons, and gassing. Calcium cyanide and carbon disulphide can be used by professional exterminators, or anyone can use the carbon monoxide gas from his car or tractor. The gas can be directed into the mouse city by a hose reaching from the exhaust pipe to beneath a tarpaulin. These are suggestions that have been advanced by scientists from all over the mouse infested part of the world, and science still works to find new weapons against mice.

It is certainly apparent that a little moderation in family matters on the part of the mice would help greatly. It was a French naturalist who suggested that the best way to stop mice plagues was to trap the mice, kill the females and release the males, who would pester the remaining females so that they would neglect their family duties. This fantastic plan has not had a fair trial.

THE AUTHOR: Miller Stewart who writes here of the field mouse in his first Farm Quarterly article is a Canadian writer and naturalist. He is a member of the Ontario Federation of Naturalists, and a frequent broadcaster over the Canadian Broadcasting Corporation. Mr. Stewart was educated in United States schools and the University of Toronto. After spending 25 years in business he turned to the typewriter and now devotes much of his time to writing articles for American, Canadian, and British publications.

PASTURE FOR POULTRY

(Continued from page 75)

whether or not it is pastured or has been cut, since some vitamins deteriorate rapidly after cutting. The six important vitamins are: (1) Carotene (which is converted into vitamin A after it is consumed)—necessary for growth, egg production, hatchability, and as a preventative of eye diseases; (2) vitamin B_1 (thiamine) for growth, appetite, and health; (3) vitamin B_2 or G (riboflavin)—for hatchability, growth, full feed utilization, and to prevent curled toe paralysis; (4) vitamin K—to prevent hemorrhages; (5) vitamin B_6 (pyridoxine)—a dietary requirement of poultry; and (6) vitamin D—for the formation of bones, feathers, and eggshells and to prevent rickets. Even though their feed may not supply all the vitamin D required, chickens ranging outdoors will not need vitamin D supplements in their ration because of their being exposed to the ultraviolet, antirichitic rays of direct sunshine.

Minerals In Forage

Essential minerals, such as calcium and phosphorus, which are required for proper bone and feather development, are also found in forage crops, particularly in plants kept in growing, immature stage by repeated cutting or growing. Some of the other vitamins found in green feed, such

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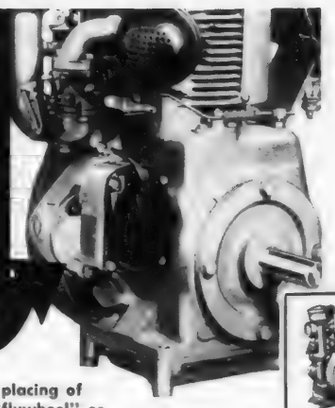

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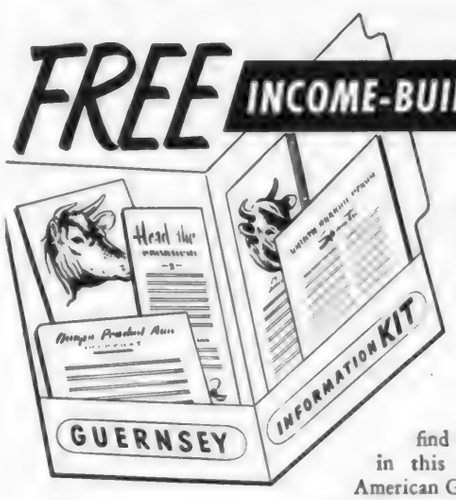

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as vitamin E, found in wheat germ oil, are now thought to be relatively unimportant to poultry.

Pasture Management

Poultry pastures should be developed on well-drained, fertile land at least 500 feet from the nearest poultry house for control of possible diseases, and should be supplied with good drinking water for the flock. The area should be divided into three or more lots to permit the birds being moved from one range to the other every four to six weeks. This moving from range to range has the advantage of providing fresh green feed for a longer period of time, especially if annual crops are being used for pasture. Rotating the range is also of great help in cutting down on diseases and parasite infestation. For the same reason it is customary to keep the flock moving on each of the ranges by moving all shelters, feeders and roosts at weekly intervals.

Most farmers know that in the world of poultry, chickens have the well-deserved reputation of Typhoid Mary and that turkeys should not be put on a range that has been used for chickens. If they are to avoid heavy turkey losses due to blackhead disease, poultrymen must plow and reseed or vacate for at least two years land that has been used for chicken pasture.

Variety In Pastures

Many crops are used for poultry pastures, among them alfalfa, bluegrass brome grass, bermuda grass, sudan grass, soybeans, white, sweet, and ladino clovers, lespedeza, rye grass, vetch, cowpeas, rape, and the cereals, oats, barley, wheat, rye, millet and sorghum. Most poultrymen prefer a pasture mixture that will contain several of the pasture plants such as alfalfa and grass, lespedeza or clover and rye grass small grain and vetch. Such a mixture will extend the pasture season. The season could be extended too long, however—frozen greens should never be fed to poultry; such feed can cause sickness and serious losses. Sunflowers or corn are often planted along the division fences for shade during the grazing season and for their seed later on.

In order to minimize their disease and and parasite problems, some poultrymen prefer annual pastures that are deep plowed and reseeded each year. Fertilizing and irrigating poultry pastures, when these practices seemed called for, has been found to pay. Poultry manure, however, on fully stocked pasture will usually be sufficient to build up the soil fertility.

Yields of young pasture crops vary widely due to soil and weather conditions, irrigation and other factors. In the state of Washington a check was made of poultry pastures to determine the pounds per 1000 square feet of land. Alfalfa ran from 354 pounds to 850 pounds; clover and grass mixture, 350 to 450; cereals, 100 to 250; sudan grass, 150 to 350; and rape, 250 to 350.

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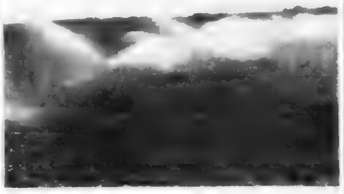

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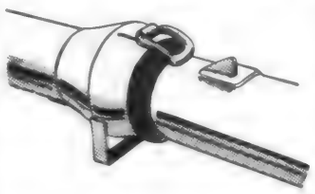

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The carrying capacity of an acre of pasture naturally depends on the crop and its condition and the type of bird that is being pastured. Good pasture is generally figured as carrying 300 to 500 growing chickens per acre, or 125 to 250 laying hens, or 100 to 200 turkeys.

Green feed plants are succulent, highly palatable, and rich in nutrients during their young growing stage: after blossoming most of them lose much of the nutritiveness and palatableness which characterised the young shoots and grasses. Kentucky experimenters found that laying hens required 20 per cent less concentrates when pastured on young bluegrass as compared to dry lot hens, but when the grass matured, the hens ate so little that there was no appreciable difference between their feed and that of the dry lot birds. If the range is under-stocked it should be mowed several times during the grazing season to prevent the plants reaching the heading stage and to stimulate new growth.

One enterprising poultry farmer has added an element of profit in the solution to the pasture mowing problem. He lets sheep do it for him. Finding that there were no diseases that the sheep could give his chickens or the chickens pass on to the sheep, he installed a small herd of Suffolk ewes which he moves from pasture to pasture ahead of the chickens to keep the grass clipped.

Grass Silage For Chickens

If grass silage is being made for other livestock on the farm, poultry can share this succulent winter feed just as it is prepared for the cattle. If no silo is available, or if grass silage is being made for poultry alone, somewhat different methods may be used in preparing silage for chickens. While silage for livestock usually is made from crops harvested shortly before maturity, poultry silage, to be rich in proteins, should be prepared from immature grasses, legumes, or cereals. The plants should be cut before blooming and should be more finely chopped than would be done for cattle.

Poultry silage can be preserved from second and third cutting alfalfa, young grass, or clover to produce an easily digested protein feed that is rich in vitamin A and B_2. A simple method of preserving the grass is to cut it in ¼-inch lengths; let it wilt to reduce the moisture content from around 80 per cent to around 65 per cent; then pack it into clean, air-tight barrels. Mixed with the chopped grass as it is put into each 50 gallon barrel, are four gallons of molasses which have been diluted with 16 gallons of water. The molasses, rich in the fermentable carbohydrates which green feeds lack, greatly improves the quality and palatability of the silage. The barrel lid, which must be somewhat smaller than the container's opening, is pressed down into the grass-filled barrel with 300 to 400

Modern

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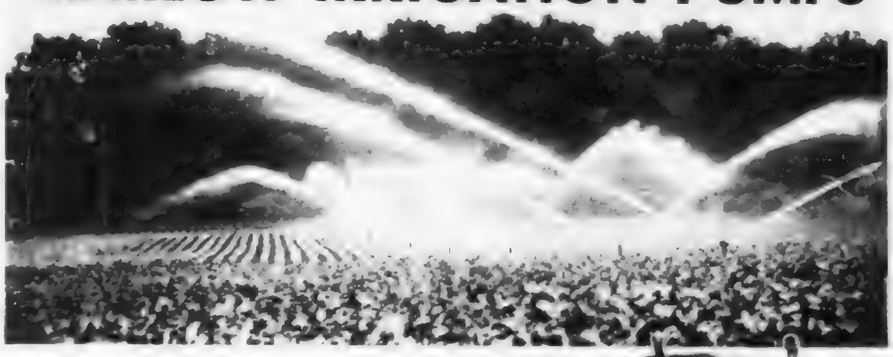

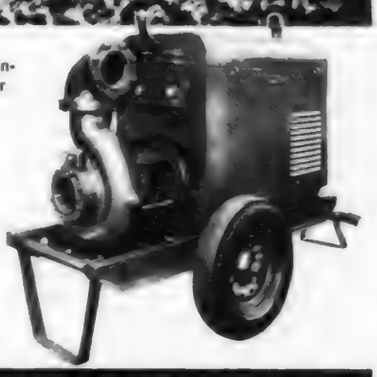

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pound weights. As the grass settles, more of it must be added to keep the barrel full and tightly packed. After settling a few days, an airtight lid, or a double layer of tarpaper, is put on top of the container which should then be stored for three months in a cellar or cool pit.

When the silage barrel is opened, it will be found that the top layer will be slightly mouldy and should be discarded. The ciderlike smelling ensilage that remains may be fed at the rate of two to five pounds daily to each 100 laying hens and up to 12 pounds per 100 to turkeys.

When fed at the rate of five pounds per 100 laying hens, silage may cause a darkening of the color of the egg yolks. This discoloration does not affect the eggs of all hens and may disappear after a few days. If it does not, the amount of silage fed should be reduced. It isn't that the darker color of the yolk is bad in itself—it actually means that the egg has more food value—but dark yolked eggs will bring a lower grade on the market.

Mix Silage and Mash

The usual method of feeding grass silage is to mix it with the dry mash. Small amounts of the silage are mixed with the mash to begin with and the amount is then increased from day to day until the full ration is being fed. One Ohio farmer, ignores the gradual approach and the disguise of dry mash, feeds his chickens the same grass silage he feeds his cows—and he feeds it to them straight. They eat it readily.

Andreus Jacobson, the transplanted Norwegian poultryman, was following old established European custom when he put his Utah chickens on pasture. A visitor in Scotland, where most poultry is battery housed during the productive period, reports, "I saw hundeds of movable poultry houses with attached enclosures out in the pastures. I asked why they followed this pasture practice and was surprised when the proverbially close-fisted Scotsman answered, 'First, for the health of the flock; second, to save money on feed." The system followed in Scotland calls for a daily move of the poultry house so that the chicks, which are put out to pasture at five weeks of age, do not spend more than 24 hours on any one piece of land.

American poultrymen probably never will find it worth while to build silos, but, where land is available, they may turn more and more to pasture and, in the cool of the egg cellar, may store barrels of succulent silage.

THE AUTHOR: Born in Austria at the turn of the century and educated at the Technical College and the University of Vienna, Rudolph Seiden had established himself as a chemical engineer before coming to this country in 1935. He is the author of many papers with such formidable titles as *Comparing Examinations of the Influence of Various Outside Factors Especially on the Ash-Content of Plants*. He is also the editor and chief author of the well received *Poultry Handbook*.

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DOES A PARLOR PAY

(Continued from page 73)

parlors, and after checking with him, the county agent, and perhaps a few nearby farmers who are using milking parlors, the farmer should have little trouble choosing his plan.

Wisconsin has conducted tests to determine the actual labor saved with milking parlors as compared with stanchion barns. They clocked the work of milker operators in both types of barn and found that milking in the parlor takes about 10 per cent less time than in stanchions. If a farmer who spends 10 hours a week milking switched to a milking parlor he could possibly save one hour a week or six and a half eight hours working days annually. He saves most of this time by not having to carry pails of milk from the far end of a stanchion barn, or by piping milk from cow to cooler.

After the milking the concrete floors can be flushed down and the room made ready for the next milking. Usually the cows are fed grain as they are milked. The grain box has a metal shield around the front to keep feed from spilling, and this is an added precaution to keep the milking parlor clean.

The farmer who has never used a milking parlor usually foresees considerable difficulty in convincing his cows that they should enter the parlor at milking time. Actually, dairymen have found this far less of a problem than they anticipated. Once the cows are accustomed to the idea they usually line up at the parlor door at milking time, and generally they line up in the same order.

With a little time and patience a dairyman can acquaint his cows with their new parlor and keep everybody happy with the change. It is a good plan to walk the cows through the parlor a few times so they won't feel like strangers in it when the first milking time comes. During this inspection trip the milking machine should be running so the cows learn that the machinery sounds louder in the small room. Let them take their time, and eventually let them eat a little grain before they leave and soon they will enter of their own accord.

In 1948, Elmer Wheaton, of Horseheads, New York, found his herd outgrowing his own barn. He decided to build a new one. He started thinking about the customary stanchion arrangement with the concrete floors, water cups, and other equipment that go with it. Then he spent some time studying the advantages of loose housing and changed his mind. After he had built his loafing shed and milking parlor he did a little scratching with his pencil and paper and decided that he had saved about $6000.

Wheaton's new loafing shed is 146 feet long and 30 feet wide. It has an earthen floor. His 50 to 60 head of cattle drink from a watering trough at one end of the room, and silage is fed in a concrete trough that extends the length of the

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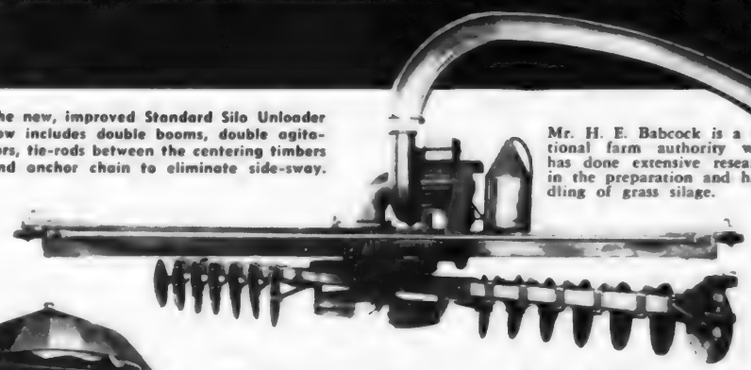

The new, improved Standard Silo Unloader now includes double booms, double agitators, tie-rods between the centering timbers and anchor chain to eliminate side-sway.

Mr. H. E. Babcock is a national farm authority who has done extensive research in the preparation and handling of grass silage.

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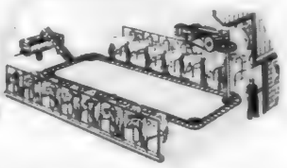

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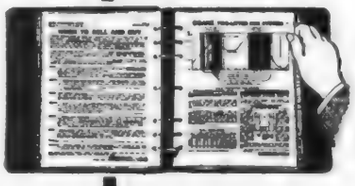

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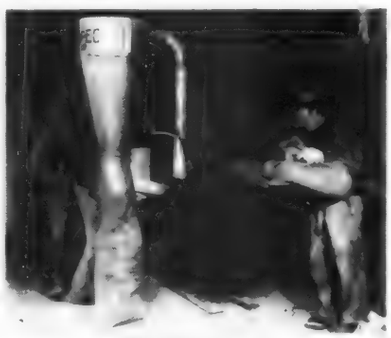

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building along the wall the silo opens into. Hay is whisked through shutes from the floor above.

At milking time Wheaton stretches a wire across the middle of the loafing shed. The wire separates the milked cows from the unmilked. When he takes his tractor mounted manure loader into the loafing shed twice a year he begins to realize that he is saving on chore time. In addition, his cows are producing just as well as they did in stanchions and to date he has had no injuries or stepped on udders. He hasn't even noticed any boss cows ruling the loafing shed. This is sometimes a problem and dairymen planning this type of housing usually start by dehorning cows.

The Loafing Shed

Farmers planning a loafing shed should keep a few simple rules in mind. The larger breeds of cows should have 100 square feet of floor space per cow. The small breeds need at least 60 square feet, and no one has shown yet that cows can have too much space in the loafing shed. Dairymen have a tendency to overprotect their cows from weather. How much cold cows can stand is a much argued question among dairymen, but the University of Wisconsin has proved that the cow can get along on less heat than we usually think. Their experiment proved that well-fed cows kept dry and out of cross drafts are not bothered by cold weather. If the loafing shed is kept warm in cold weather it becomes difficult to ventilate. Both cows and the manure packed on the floor give off moisture and ventilation must be provided to keep this moisture from condensing on the walls. It is a better arrangement to keep a large door open at all times and keep the temperature in the loafing shed about equal to the outside temperature.

The floor can be either pavement or well-packed earth. It should be as free of obstructions such as posts, water troughs, and mangers as possible to make cleaning easier.

It is good dairy management to provide a loafing area outside the barn in addition to the loafing shed. This lot can be paved, and the hay can be stacked and fed around the edges of it. If it is paved, allow 100 square feet of space per cow and if it is not paved, double the figure. This provides the cows an opportunity to spend more time in the sunlight. This barnyard should be on the south side of the barn, protected from the prevailing wind.

The farmer who uses a loafing shed arrangement must, like the farmer who uses stanchions, provide special areas for young stock. Calves are sometimes penned in by portable partitions in one corner of the loafing sheds. Other farmers prefer to keep young stock farther from the cows to eliminate the danger of sucking.

But as there are two sides to most questions milking parlor-loafing shed arrangements also have some disadvan-

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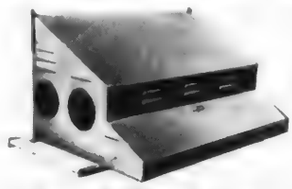

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tages. This list includes: (1) pen barns require more bedding, (2) boss cows may give trouble, (3) dehorning is a requirement, (4) it is hard to show stock properly in loafing sheds, when selling, (5) milking parlors are cold and usually require extra heat for the comfort of the person doing the milking, (6) equipment, buildings, management, and methods of doing chores must be changed.

Part of the decision as to whether or not a dairyman uses stanchions or loafing sheds will always depend on personal preferences. As long as this is true there will be stanchion barns. And stanchion barns do have certain advantages which the loafing shed arrangements can't boast. Stanchions are preferable especially for the cattle breeder who sells a lot of stock because it's easier to show stock in stanchions. The other major advantage of stanchions is the smaller amount of bedding needed. Stanchion barns are also warm enough for chores without additional heating, which is usually required in milking parlors. Stanchion arrangements also make it easier for a vet to work on a cow.

Loose housing is just one method of caring for cattle. It has both advantages and disadvantages. It looks now as though the advantages outweigh the disadvantages, and farmers will likely look upon the plan with increasing favor.

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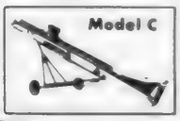

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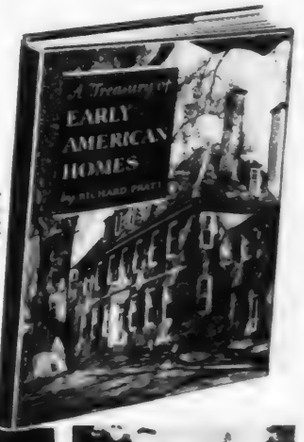

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FARM BOOKS

(Continued from page 20)

Iowa a little over 75 years ago and the first milk drying plant is less than fifty years old. The introduction of these new methods of handling milk began a revolution in dairying that has been increasing in tempo. The rapidity of this change has made it necessary to completely revise *Dairy Science* and issue a new edition of this book which has aged and gone out of date during the 11 years since the first edition was published. Artificial insemination, which was given two paragraphs in the first edition and described as a practice that was well beyond the experimental stage, has changed the whole breeding picture since 1939 and is given a full chapter in the present edition. Other practices, such as the use of milking parlors, the use of grass silage, and the changes in milking techniques have changed to the extent that the sections on them have been expanded and brought up to date.

Though the bulk of the book has been written by Dr. Petersen, who is Professor of Dairy Husbandry at the University of Minnesota, eight chapters on the economic aspects of dairying have been contributed by Dr. Harry C. Trelogan, of the U.S.D.A., and one chapter on microbiology by Dr. E. O. Herreid, of the University of Illinois. The 45 chapters written by Dr. Petersen, himself, are devoted to a thorough study of the physical make-up of dairy cattle and the care and management of a dairy herd.

These Hills Are Not Barren, *by George D. Taylor, Exposition Press, New York, $2.50*

The story of a farm and of the agricultural practices that have increased its fertility and productivity during the 130 years it has been farmed is told briefly in the Century Farm story on page 62 of this issue. A more detailed account of this same story is contained in the book that Mr. Taylor has written about his family's farm. With greater space at his disposal, he has been able to devote chapters to such subjects as the growing of cauliflower, the operation of the dairy, the gathering of maple sugar and the management of the sugar bush, the rotation practiced on the farm, and other such topics.

This book is not just an account of farming practices, it is also the homely story of the generations of Taylors that farmed the land and the history of the home that they built, told in a friendly, pleasantly flowing style. Farmers will recognize in George Taylor a sound, practical dairyman and dirt farmer, and also a literate, civilized man.

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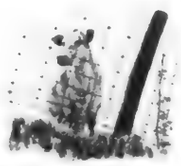
The Editors of the Farm Quarterly, after a careful selection of current agricultural books, recommend the following to our readers.



Livestock

Animal Sanitation and Disease Control—*by R. R. Dykstra*....$3.50
A review of this book may be found in the Farm Books Column.

Feeds and Feeding (21st ed.)—*by F. B. Morrison*.....$7.00
The authoritative book on livestock and poultry feeding.

Dairy Science (2nd ed.)—*by W. E. Petersen*.....$5.00
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Successful Poultry Management—*by M. A. Jull*.....$3.75
A practical book on poultry from brooding to marketing.

Pork Production—*by William W. Smith*.....$5.00
The standard text on the breeding, raising and marketing of hogs.

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Using and Managing Soils—*by A. F. Gustafson*.....$2.80
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A review of this book may be found in the Farm Books Column.

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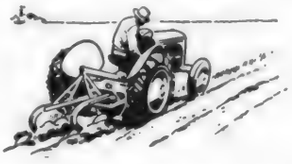

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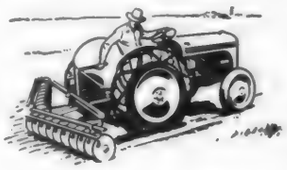

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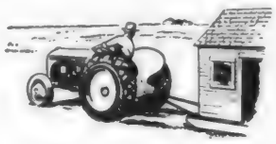

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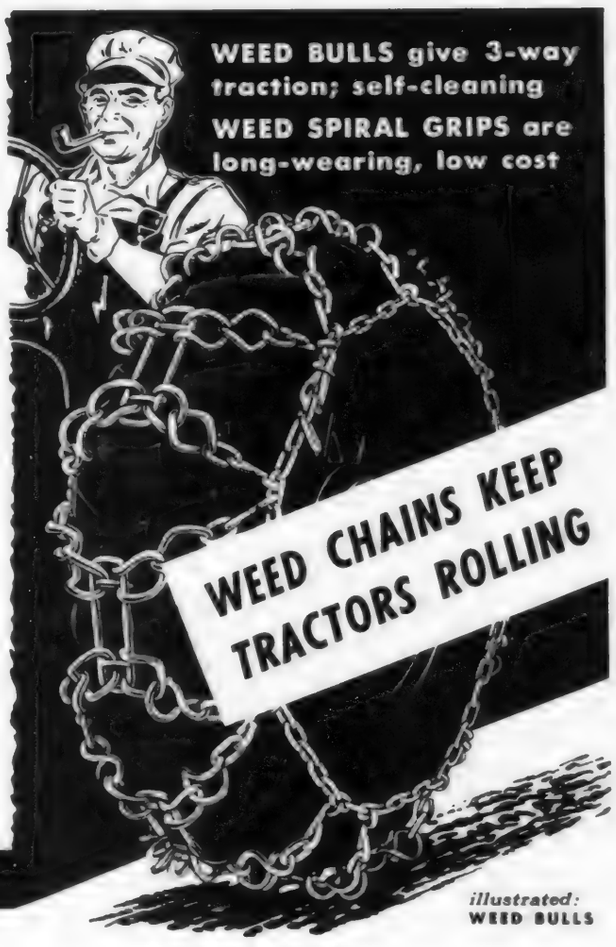
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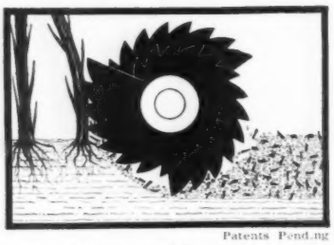

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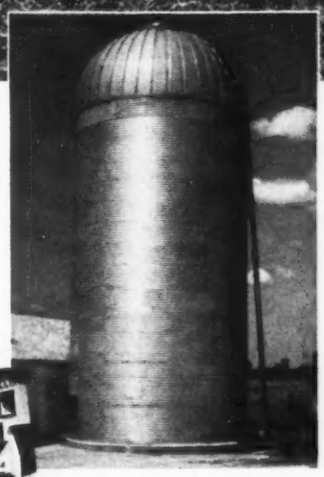

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